LUMBERMEN'S,

MILL,

MORLEY BROTHERS'

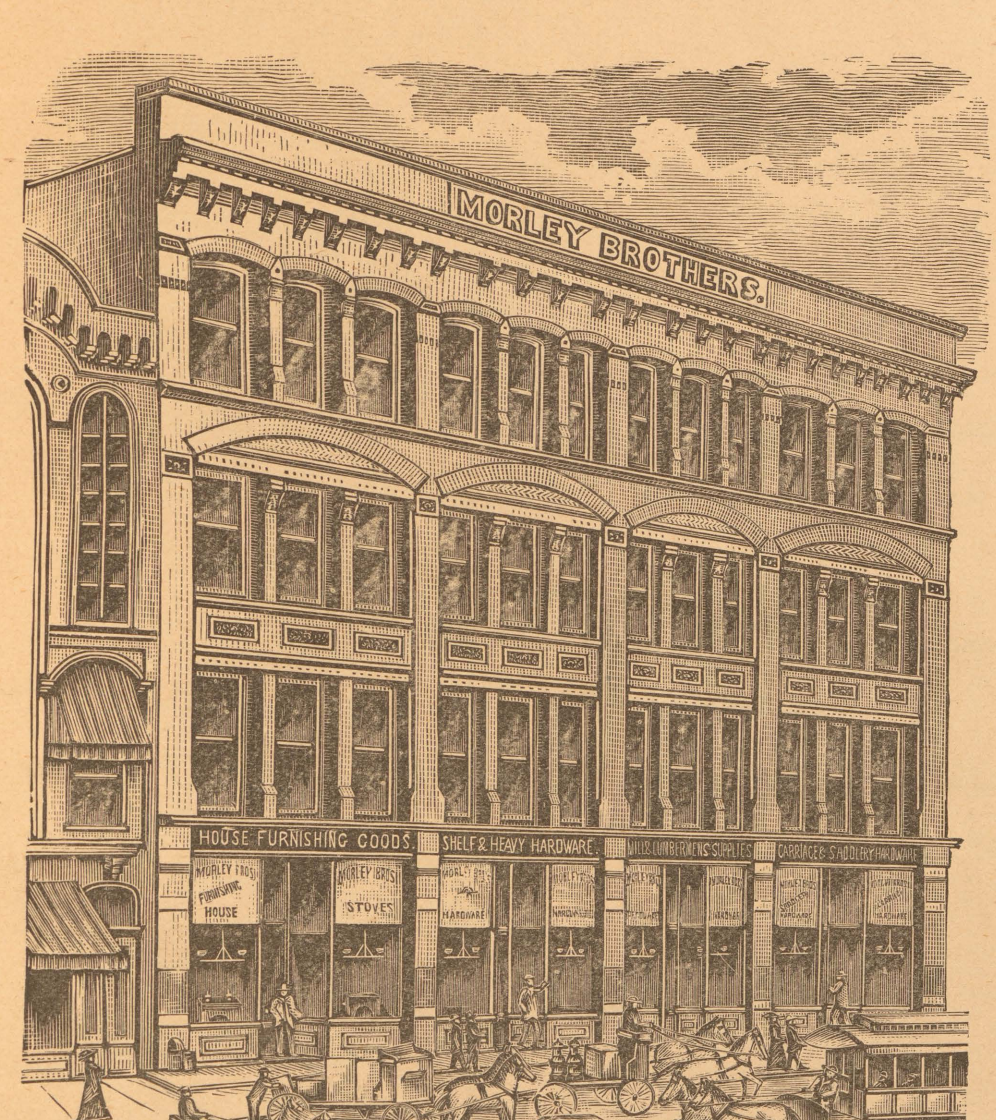
AND

MACHINISTS'

SUPPLIES.

MORLEY BROTHERS,

EAST SAGINAW, MICHIGAN.



FRONT, 90 FEET ON WASHINGTON AVE.,

150 FEET ON WATER ST. LENGTH OF BUILDING 240 FEET,

AREA OF FLOOR ROOM 80,000 SQUARE FEET.

JOB ROOMS
OF THE
SAGINAW EVENING NEWS
PRINTING AND BINDING HOUSE,
EAST SAGINAW, MICH.

1883.

TO THE TRADE.

IN presenting this Catalogue to our friends, we wish to call attention to that special branch of our business which is devoted to the Lumbering and Mill Supply Trade.

It has been our aim to illustrate those articles (a part of which are of our own manufacture) which, after twenty years' experience, we think are best adapted to that line of trade.

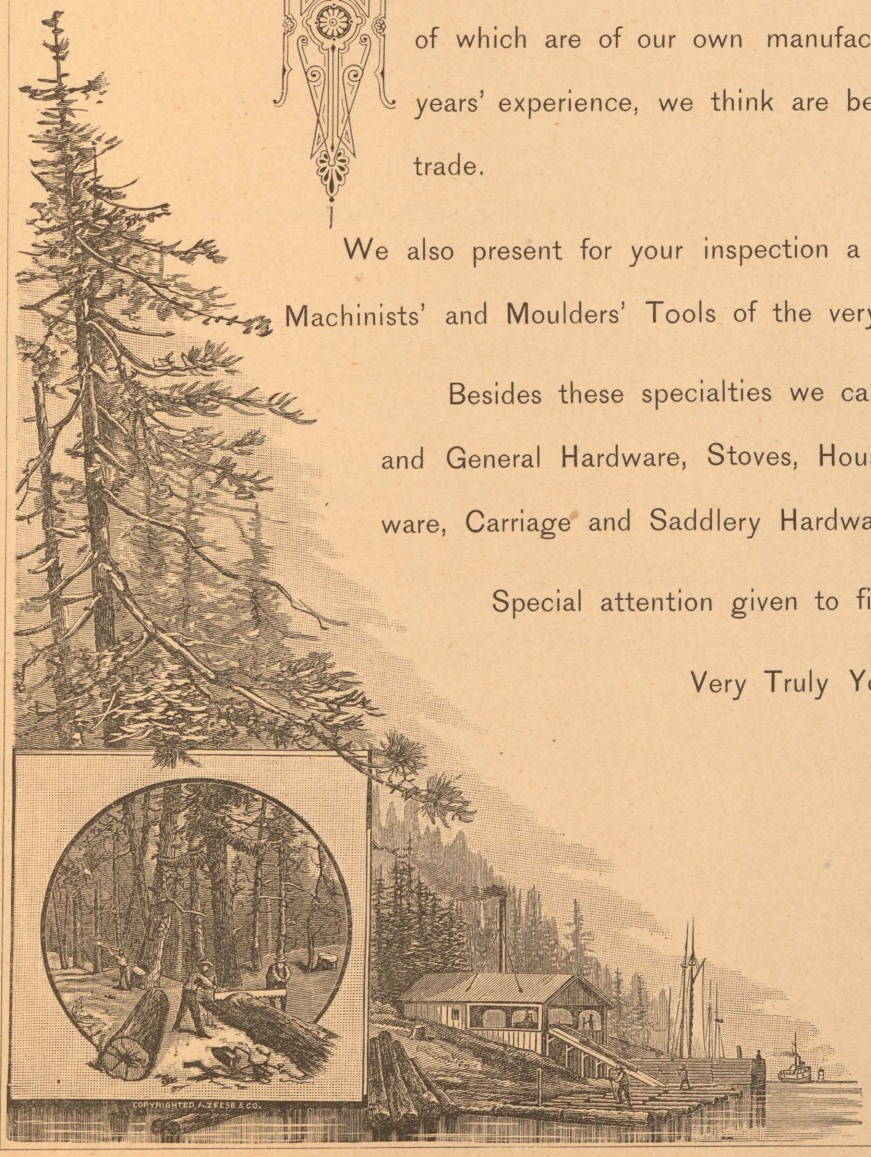
We also present for your inspection a full line of Blacksmiths', Machinists' and Moulders' Tools of the very latest patterns.

Besides these specialties we carry a full line of Builders' and General Hardware, Stoves, House Furnishing Goods, Tinware, Carriage and Saddlery Hardware, etc.

Special attention given to filling orders promptly.

Very Truly Yours,

MORLEY BROTHERS.



SHIPPING FACILITIES.

MICHIGAN.

From our desirable location near the center of the State, we can easily and quickly reach, either by rail or water, or both, every point in either the Lower or Upper Peninsula.

WISCONSIN AND MINNESOTA.

Having direct communication with Milwaukee and Chicago, we have excellent facilities for reaching the above named States, the West and Northwest, at low rates of freight.

EASTERN, SOUTHERN AND SOUTHWESTERN STATES.

We have direct communication and through rates of freight to all points in the above named States.

SPECIAL NOTICE.

In order to simplify the ordering of goods and avoid mistakes in specifying articles, we have adopted a figure number to each illustration.

When ordering please refer to these illustrations.

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Cloth
Gauges
Rope and Fastenings
Wood Carving Tools
Turning "
Wrenches
Combination
Dog
Pipe
Tap

LUMBERING TOOLS AND MILL SUPPLIES.

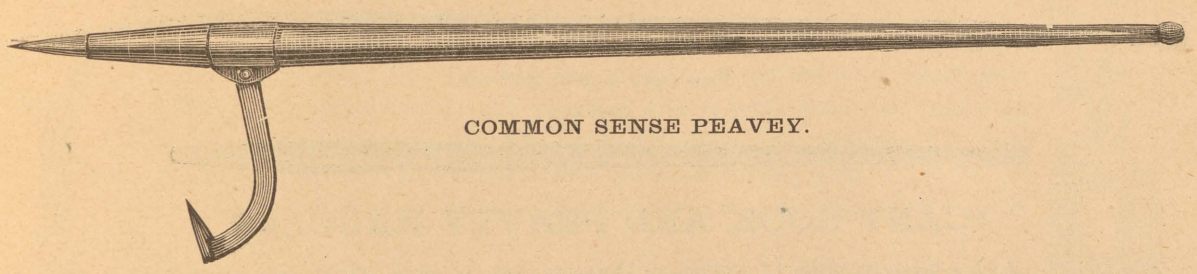
In the manufacture of Lumbering Tools we have the great advantage of being located right in the midst of the largest lumbering district in the United States, where we have had the practical experience and advice of our most experienced lumbermen to guide us.

We employ practical mechanics, who are fully acquainted with the uses of the tools we manufacture, and use nothing but the best material in construction.

We recommend these tools as being the best adapted, for actual use, of any we have seen. Our facilities for making large quantities and for shipping promptly are the very best.

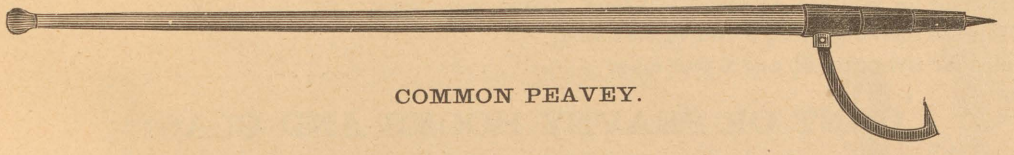
PEAVEYS.

Fig. 1.



COMMON SENSE PEAVEY.

Fig. 2.



COMMON PEAVEY.

Our Peaveys are made with Handles of hard Maple $5\frac{1}{2}$ or 6 feet long; Hooks of hammered crucible Cast Steel, $\frac{7}{8}$x$1\frac{7}{16}$ inches; Pikes of the same Steel $\frac{7}{8}$ inch square. The Pike is made long enough to run into the Handle beyond the center of Clasp, thus preventing it from breaking, and by an enormous pressure is driven into a tapering hole, giving it an equal bearing at every point. The old process of burning in the Pikes weakens the Handles. The Clasp is made of the best *Norway Iron*, and in the Common Sense Peavey the jaws of the Clasp are $3\frac{1}{2}$ inches long, being full length of Clasp, and being tapered has no projecting shoulders like the Common Peavey Clasp.

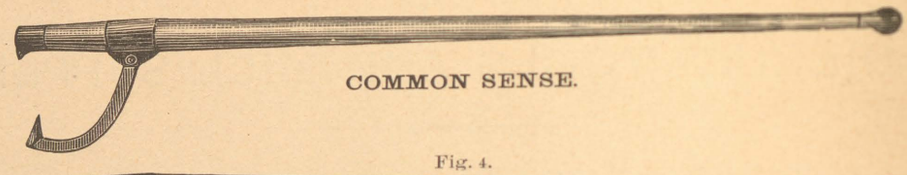
Our aim has been to make the Peavey light enough to be easily handled, and at the same time retain the strength that is needed. For this reason we prefer the forged *Norway Iron Clasp*, as it is *strong, light and durable.*

We can furnish these Peaveys with Hickory, Ash or Iron-wood Handles, if so desired.

Common Sense Peaveys, complete, per dozen,	$26 00
Common Peaveys, complete, " "	24 00

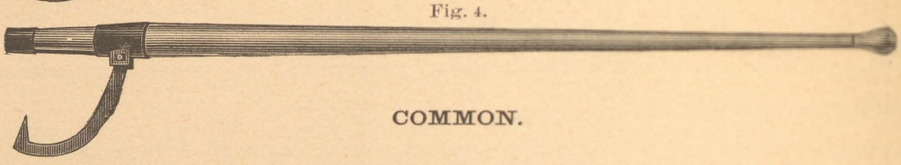
CANT HOOKS—COMPLETE.

Fig. 3.



COMMON SENSE.

Fig. 4.



COMMON.

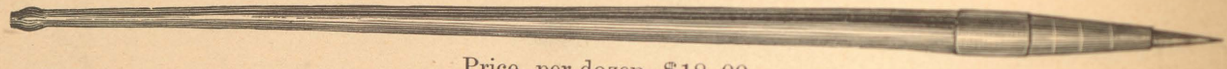
FOR WOODS AND MILL PURPOSES.

Handles are hard Maple, $4\frac{1}{2}$, 5 or $5\frac{1}{2}$ feet long. Hooks are made of hammered crucible Cast Steel, $1x\frac{1}{2}$ or $\frac{7}{8}x\frac{1}{2}$ inches. The Clasp is made of the best Norway Iron, and for the Common Sense Cant Hook we use the same Clasp as in Common Sense Peavey. The Bolt is made of Steel, square under head. The Heel is made of heavy band Iron, with a nib to catch on the log, and is connected to Clasp by a piece of half-round Iron, thus making it very strong, and preventing wear of the Handle.

Price per dozen, Common Sense,..... ....$23 00 Price per dozen, Common,.....$21 00

DRIVING PIKES.

Fig. 5.



Price, per dozen, $18 00.

Fig. 6.

CANT HOOK AND PEAVEY HANDLES.

We carry in stock a large quantity of the above Handles made of hard Maple, Iron-wood, Hickory and Ash.

Cant Hook Handles for mill use, $4\frac{1}{2}$ and 5 feet long, Maple, per dozen,.....$3 00
Cant Hook Handles for woods use, 5 and $5\frac{1}{2}$ feet long, " " " 3 25
Peavey Handles for river use, $5\frac{1}{2}$ and 6 feet long, " " " 3 25

CANT OR PEAVEY HOOKS AND CLASPS.

Fig. 7.

DUCK BILL.

Fig. 8.

ROUND BILL.

Our Cant and Peavey Hooks are made of crucible Cast Steel; Cant Hooks of $\frac{7}{8}x\frac{1}{2}$ or $1x\frac{1}{2}$, and Peavey Hooks of $\frac{7}{8}x\frac{7}{16}$. Can use any other size Steel if desired. We make three patterns, viz: Duck Bill, Round Bill and Wisconsin and Minnesota Chisel Point patterns.

Price, per dozen, Common,.....$13 50
" " " Common Sense,..... 15 50

CHISEL POINT.

Fig. 9.

WISCONSIN OR MINNESOTA PATTERN.

CANT HOOK OR PEAVEY CLASPS AND BOLTS.

Fig. 10.

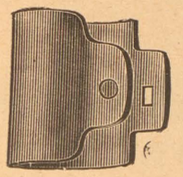
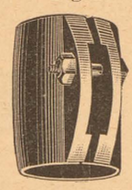
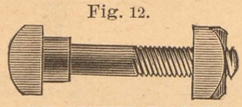


Fig. 11.



COMMON SENSE CLASP.

Fig. 12.



PEAVEY BOLT.

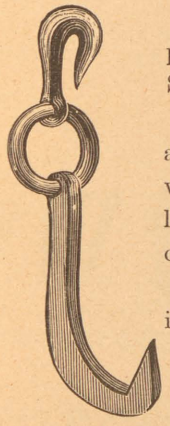
Our Clasps are forged of one piece of best Norway Iron, with round hole on one side and square hole on the other side.

Our Peavey Bolts are made either of Steel or Norway Iron. The size is $1\frac{3}{4}$x$\frac{7}{16}$ inches, and are made square under the head so that they cannot turn when the Clasp is being tightened.

Price, per dozen,	Clasps,	Common,	$4 25
" "	"	Common Sense,	6 00
" "	100 Bolts,	Steel,	5 00
" "	"	Norway Iron,	4 00

SWAMP HOOK.

Fig. 13.



Our Swamp Hook is made of one inch square crucible Cast Steel. The point is made either round or chisel pointed. The Grab Hook is made of Lake Superior Iron.

The Loading Block (made of Iron, except the Bolt, which is Steel,) has, on account of its cheapness, durability and strength, given universal satisfaction wherever introduced. It is used (generally with $\frac{5}{16}$ inch Chain) for rolling up logs from skids and loading sleighs. We use $5\frac{1}{2}$x$1\frac{1}{2}$ inch Sheave. The Bolt can be easily removed and a new Sheave substituted when worn.

The Swivel Hook is made of Lake Superior Iron and can be made to grab if preferred.

Price, each,	Swamp Hooks,	$2 00
" "	Loading Blocks,	2 50

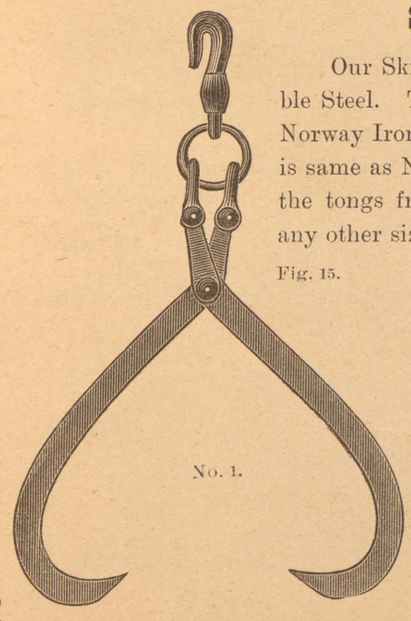
LOADING BLOCK.

Fig. 14.

SKIDDING TONGS.

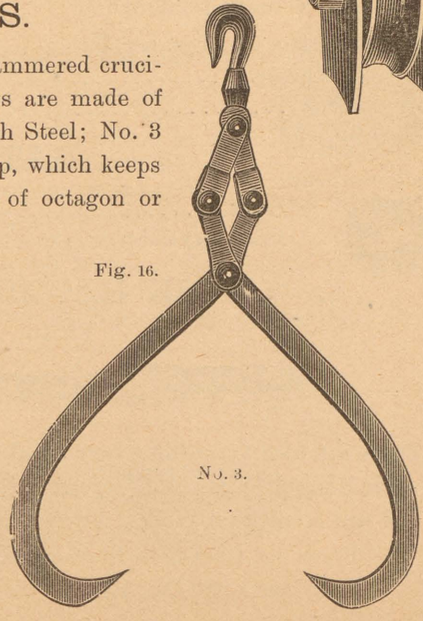
Our Skidding Tongs are made of hammered crucible Steel. The Swivel Hook and Clevises are made of Norway Iron. No. 1 is made of $1\frac{1}{2}$x$\frac{5}{8}$ inch Steel; No. 3 is same as No. 1, excepting the patent top, which keeps the tongs from turning. We can make of octagon or any other size Steel, if desired.

Fig. 15.



No. 1.

Fig. 16.

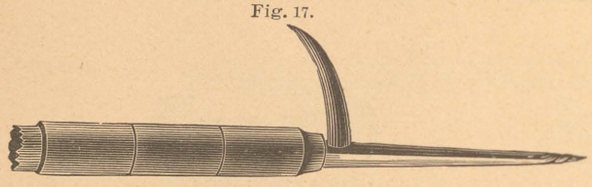


No. 3.

Price, each, $5.50.

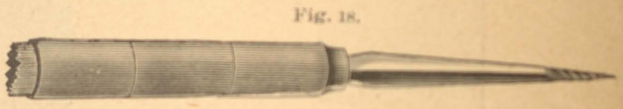
PIKE POLES.

Fig. 17.



WITH PIKE AND HOOK.

Fig. 18.



WITH PIKE.

Above are made with white Ash Poles (from 12 to 20 feet long) and Pikes and Hooks are made of hammered crucible Cast Steel. Patent Seamless Ferrules No. 16 Iron. Pike Tangs are $\frac{1}{2}$ inch square, 6 inches long and are driven, by an enormous pressure, into a $\frac{7}{16}$ inch hole; can never come out.

Length,	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
Poles with Pike and Hook, per dozen,	$14 00	$15 00	$17 00	$20 00	$26 00
Poles with Pike only,	12 00	13 00	15 00	18 00	24 00

Pikes without Hook, per dozen, $2; Pikes with Hook, per dozen, $4; Patent Seamless Ferrules, per dozen sets, $3.

PIKE POLES (Not Ironed.)

We keep a large stock of Ash Poles, not ironed off, and can fill orders promptly.

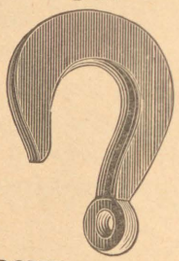
Length,	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
Price, per dozen,	$8 00	$9 00	$11 00	$14 00	$20 00

CHAIN HOOKS AND COMMON COLD SHUTS.

Fig. 19.

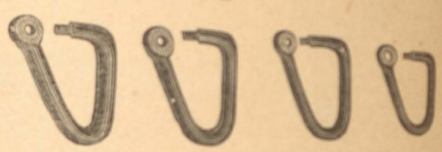
GRAB HOOK.

Fig. 20.



ROUND HOOK.

Fig. 21.



COMMON COLD SHUTS.

Our Grab and Round Hooks and Common Cold Shuts are made of the best Lake Superior Iron, all made by hand and inspected before sending out.

Grab and Round Hooks, large, per dozen, ... $3 50 Medium and small, per dozen, ... $3 00

Common Cold Shuts,	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$
Price, per dozen,	55c.	60c.	75c.	80c.	$1 00	$1 50

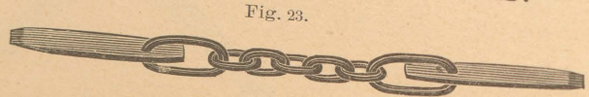
Fig. 22.

PATENT COLD SHUTS.

Sizes,	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Price, per dozen,	$1 50	$1 65	$1 80	$2 00	$3 00	$4 25

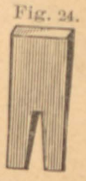
CHAIN RAFTING DOGS.

Fig. 23.



RAFTING PINS.

Fig. 24.



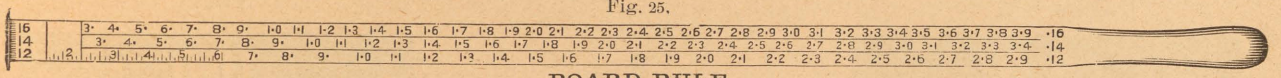
These are used for rafting hard wood timber. We use $\frac{5}{16}$ inch Chain and $1\frac{1}{8}$x$\frac{3}{8}$ inch Iron for Dogs. They are very strong, easily driven, can fit any size pole and can be used for years. Any special sizes or lengths made to order.

Price per 100 Chain Rafting Dogs, ... $15 00

Price per 1,000 Oak Rafting Pins for $\frac{1}{2}$ inch rope, ... 5 00

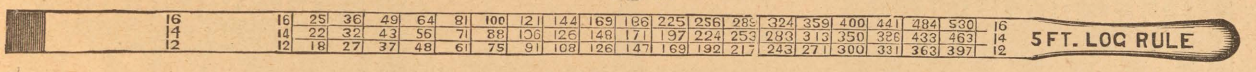
BOARD AND LOG RULES.

Fig. 25.



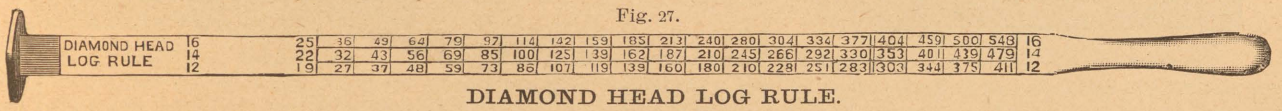
BOARD RULE.

Fig. 26.



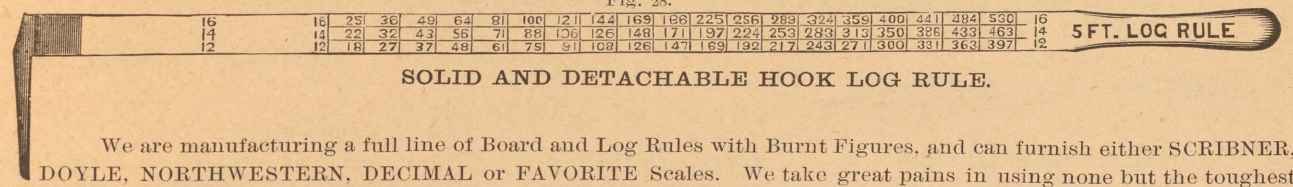
PLAIN HEAD OR WOODS LOG RULE.

Fig. 27.



DIAMOND HEAD LOG RULE.

Fig. 28.



SOLID AND DETACHABLE HOOK LOG RULE.

We are manufacturing a full line of Board and Log Rules with Burnt Figures, and can furnish either SCRIBNER, DOYLE, NORTHWESTERN, DECIMAL or FAVORITE Scales. We take great pains in using none but the toughest of straight grained Second Growth Hickory, as we fully appreciate the uses that Rules are put to, and what they are expected to stand.

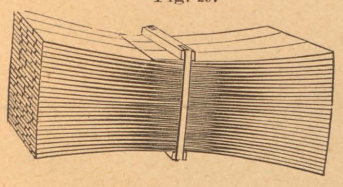
	Price Each.
No. 1, 3 Tier, 3½ feet, Inspector's Board Rules, Heavy,	$2 25
" 2, " " 3 " Board Rules, Extra Heavy, 2 inch Head,	2 25
" 3, " " " " " Brazed Head,	2 00
" 4, " " " " " "	1 75
" 7, 4 " " " " " Brazed Head,	2 00
" 8, " " " " " " "	2 25
Log Rules, all Scales, Plain without Head,	1 75
" " " " with Plain Head,	2 00
" " " " Solid Hook,	2 00
" " " " Diamond Head or Detachable Hook,	2 25

BOARD AND LOG RULE COMBINED.

We have recently added to our list a very useful Rule, same shape as our Board Rule, 3½ feet long, four tiers of figures on each side—one side giving board measure and the other side log measurements, for 10, 12, 14 and 16 feet Stuff. Price, $2.25 each.

SHINGLE BANDS.

Fig. 29.



The problem of getting a Shingle Band that would *stand* the hard usage that it is put to has been a serious one with all Shingle Manufacturers.

We fully appreciate what is needed, and for several years have been giving this subject our special attention.

Our machines for cutting and punching Bands are driven by power, so can fill orders promptly, and we *guarantee* to furnish an article which we can warrant to be all that is required. We buy the *best* Sheet Iron we can get, and use great care to see that no imperfect Iron is used, and we cut *every* Sheet *with* the grain of the Iron and use great care in punching. We are able to furnish a good Band.

We use No. 24 Sheet Iron, but can cut No. 25 or No. 26 when desired. We guarantee every Band to be perfect.

Our own make of Bands are put up in boxes just wide enough to take in the Bands so that they lay straight and do not get mixed, as when packed in barrels, and are more easily taken out. Boxes weigh about 350 pounds each.

We also make a specialty of furnishing Heading Bands from 20 inches to 26 inches long. Also Galvanized and Painted Shingle Bands.

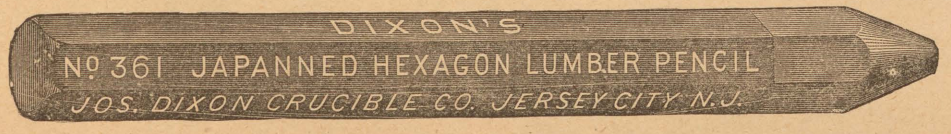
MARKING HAMMER.

Fig. 30.

Price according to design.

DIXON'S LUMBER PENCILS—OCTAGON AND SQUARE.

Fig. 31.



Price, per gross, No. 361, Octagon, $9; Price, per gross, No. 360, Square, $9.

We carry both kinds, but the Octagon is preferred.

BOOT CALKS AND SETS.

Fig. 32.

Fig. 34.

Fig. 33.

For years we have made a specialty in the manufacturing of Steel Boot Calks to drive. We put them up in boxes containing 100 Ball Calks or 50 Heel Calks. Where a customer buys a quantity we print his name on the boxes under "manufactured for," with his address. The proportion is about four Ball Calks to one Heel Calk. The Set is made of Cast Steel and is used for driving the Calks into the boot. Ball and Heel Calks, per 1,000, $6. Sets, per dozen, $3.

Fig. 35.

BEADED BOOT CALKS.

Ball Calks, small, per 1,000,	$ 6 00
" " medium, per 1,000,	7 00
Heel Calks, per 1,000,	10 00

SAW GUMMERS.

Fig. 36.

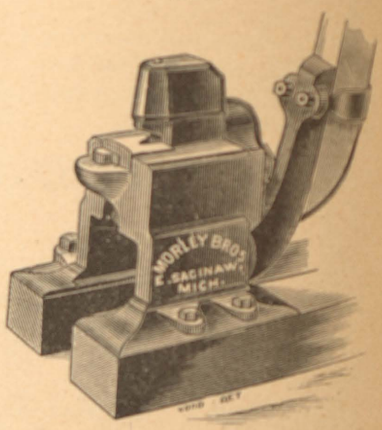
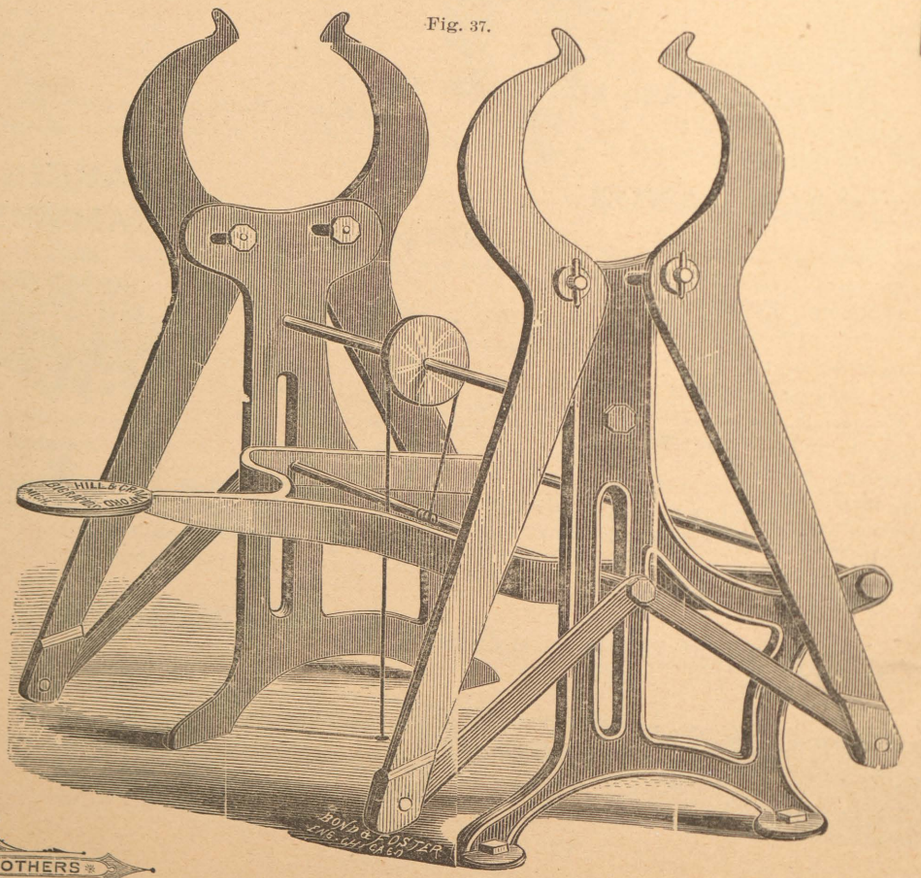


Figure 36 represents our Saw Gummer. This Gummer is particularly designed for use in gumming Cross Cut Saws. It may soon be made to pay for itself in saving Saws and in the extra amount of work that a Saw may be made to do when it is kept sharp by being gummed. Price, each, $16.00.

Fig. 37.



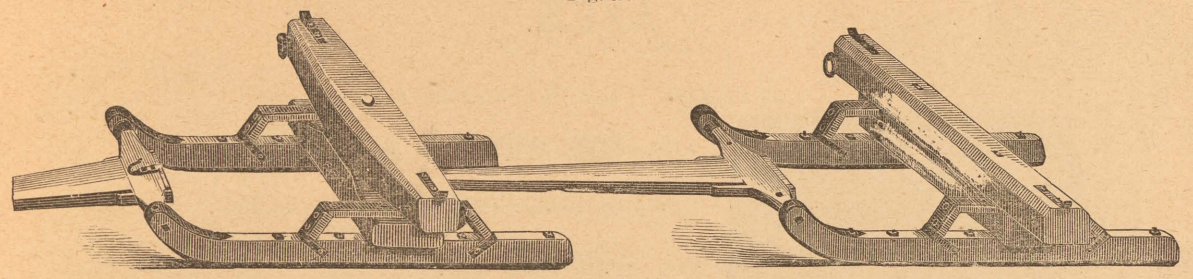
SHEPARDSON'S PATENT LATH BINDER.

Price each with Iron Arms, $30
" " " Steel " $35

LARGE MACHINE for binding 100 Lath in Bundle.
Price each with Iron Arms, $35

THE STATE OF MAINE LOGGING BOBS.

Fig. 38.

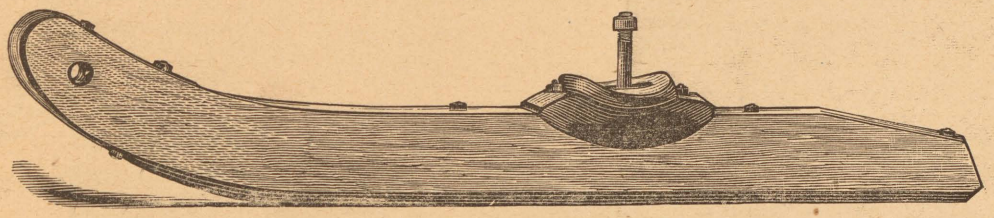


Runners, 4x6, 7 feet on the run, and any width of Tread desired. Beams—Front, 8x12; Hind, 8x8; Front Bunks, 8x12; Hind, 8x8.

We vary these sizes to suit customers, where the regular size is not heavy enough, but make an additional price for heavier Sleighs. Can make with Sway Bars or use the Patent Saddles, if desired. Price, complete, $75.00.

THE SAGINAW LOGGING SLEIGH SADDLES, RUNNERS AND SHOES.

Fig. 39.



Size of Saddles, inches.	2	2½	3	3¼	4	Bolts for same, for	2 in.	2½	3	3¼	4
Price, per set of four	$6 50	$6 50	$8 20	$8 20	$8 20	Price, per set	$1 60	$1 60	$2 40	$2 40	$2 40

Logging Bob Runners, Natural Crook, 7½ feet long, 3½ feet wide, per set of four pieces, (not ironed) $7 00

Cast Sleigh Shoes, ground oval face, per lb. .....

Steel Sleigh Shoes, not shaped, per lb. .....

YOKES AND BOWS.

Fig. 40.

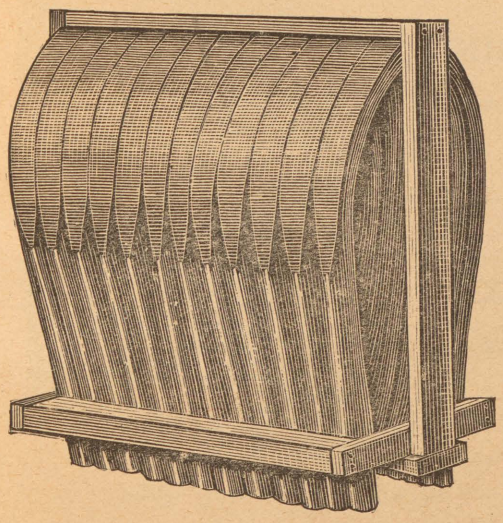
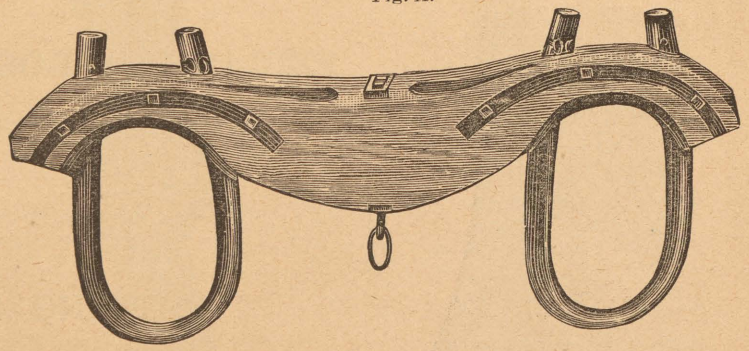


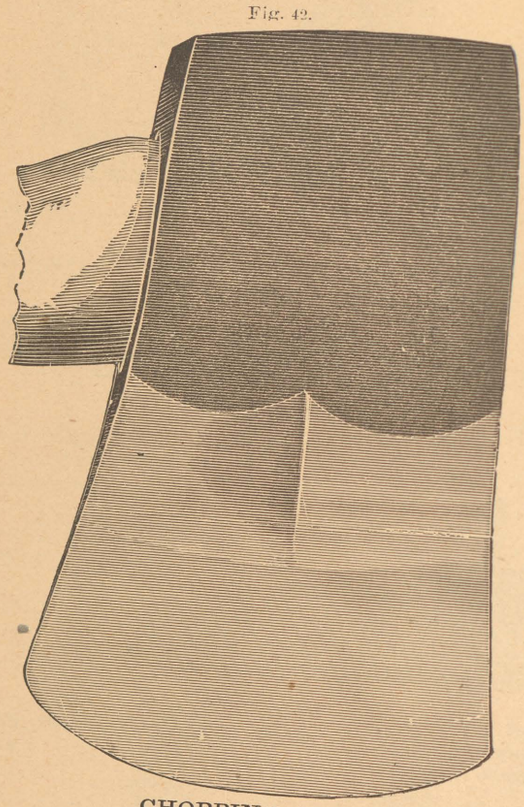
Fig. 41.



Bows, Common, 2 to 2¼ inches, per dozen pairs	$ 8 00
" California, 2 to 2¼ inches, " "	10 00
" Light Finished, 1¾ inches, " "	10 00
" " " 2 inches, " "	12 00
Yokes, Heavy Common, price each	3 00
" " (Ironed Complete) Figure 41,	10 00

AXES.

Fig. 42.



CHOPPING AXE.

CHOPPING AXES.

"PERFECTION"—Tripple Steel Polished.

"PERFECTION"—BRONZED.

"HARVEY"—BRONZED.

"CHOPPER'S DELIGHT"—BRONZED.

"MANN'S,"—BRONZED.

"MICHIGAN STAR"—BRONZED.

Fig. 43.

SCORING AXE.

SCORING AXE.

"PERFECTION,"—BRONZED.

Fig. 44.

PEELING AXE.

PEELING OR ROSSING AXE.

"PERFECTION"—BRONZED.

RAFTING AXE.

"PERFECTION"—BRONZED.

Fig. 45.

RAFTING AXE.

All of our brands, excepting Michigan Star, warranted not too soft and free from flaws.

DOUBLE BITTED CHOPPING AXES.

"PERFECTION"—BRONZED.

"HARVEY"—BRONZED.

"CHOPPER'S DELIGHT"—BRONZED.

"MANN'S"—BRONZED.

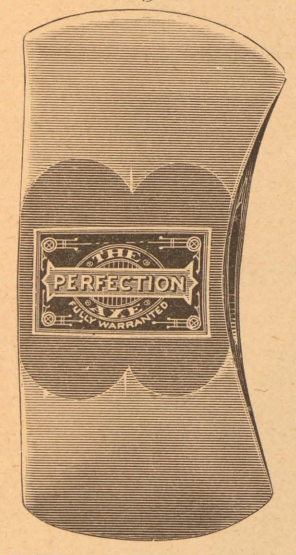
'MICHIGAN STAR"—BRONZED.

DOUBLE BITTED PEELING AXE.

"PERFECTION"—BRONZED.

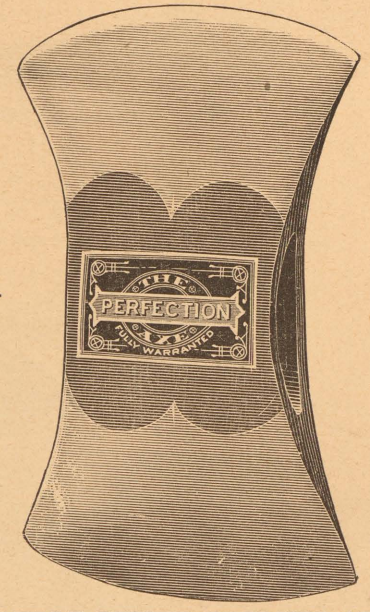
All of above brands, excepting MICHIGAN STAR, warranted not to be too soft and free from flaws.

Fig. 46.



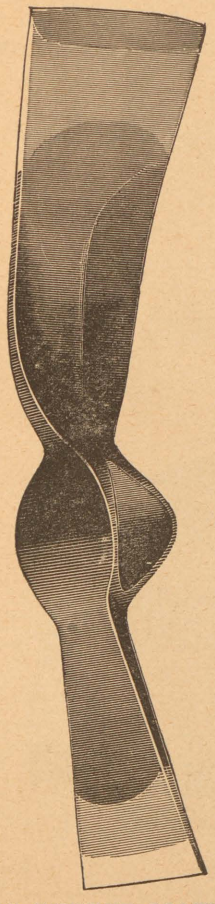
DOUBLE BITTED AXE.

Fig. 47.



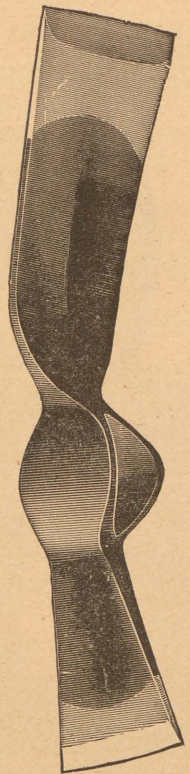
DOUBLE BITTED PEELING AXE.

Fig. 48.



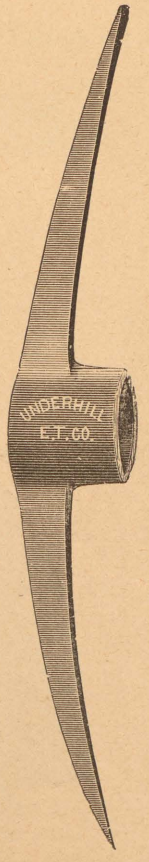
LONG CUTTER MATTOCK.
List, $16.00 per dozen.

Fig. 49.



SHORT CUTTER MATTOCK.
List, $15.50 per dozen.

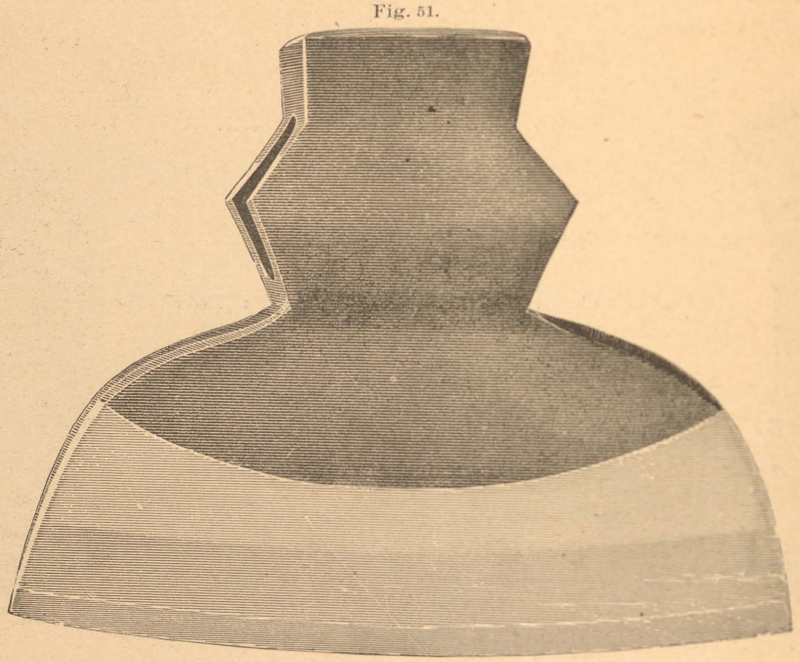
Fig. 50.



RAILROAD PICK.
List, 5 to 6 lbs., $12.00 per dozen.
" 6 to 7 lbs., $13.00 " "

BROAD AXES.

Fig. 51.



WESTERN PATTERN BROAD AXE.

List, per dozen Assorted, 5½ lbs. to 7½ lbs. $32 00
" " " 6 lbs. to 8 lbs. 35 00
" " " 8 lbs. to 9 lbs. 38 00

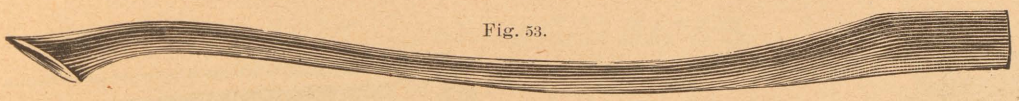
Fig. 52.

CANADA PATTERN BROAD AXE.

List, per dozen, (12 to 14 inches) $45 00

HANDLES.

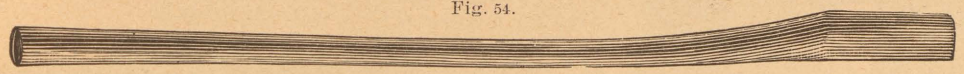
Fig. 53.



HAND SHAVED "SAGINAW PATTERN," EXTRA—SECOND GROWTH.

Saginaw Pattern, Extra, 36 or 38 inches long, per dozen, ...
No. 1 Shaved, " " " " " .....
No. 1 Turned, " " " " " .....
Saginaw Pattern, 40 to 44 inches long, for Square Timber Work, per dozen, ...

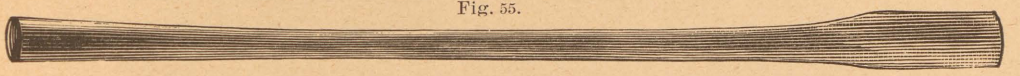
Fig. 54.



SINGLE BIT STRAIGHT—HAND SHAVED EXTRA—SECOND GROWTH.

Saginaw Pattern—Extra, 36 or 38 inches long, per dozen, ...

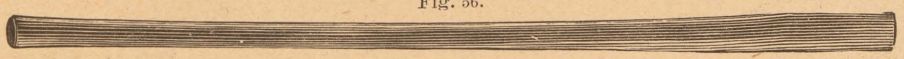
Fig. 55.



DOUBLE BIT STRAIGHT HAND SHAVED EXTRA—SECOND GROWTH.

Saginaw Pattern—Extra, 38 inches long, per dozen, ...

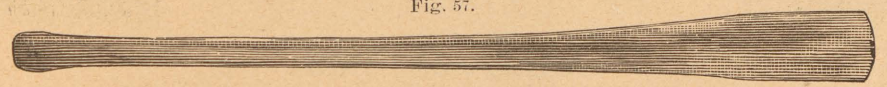
Fig. 56.



SLEDGE HANDLE.

30 to 36 inches long, per dozen, ...

Fig. 57.



PICK AND MATTOCK HANDLE.

Per dozen, ...

Fig. 58.

BROAD AXE HANDLE.

Per dozen, ...

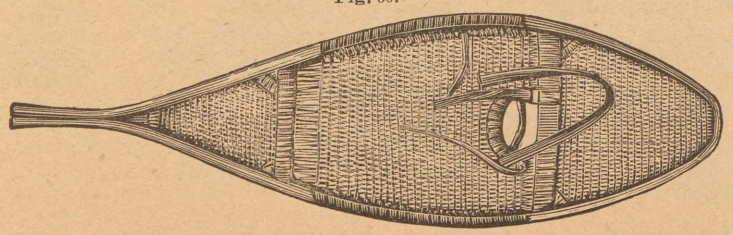
Fig. 59.

HAMMER HANDLE.

All lengths on hand for either Adze-eye or Oval-eye Hammers.

INDIAN SNOW SHOES.

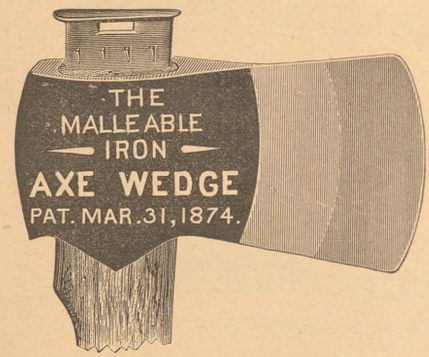
Fig. 60.



Price, per pair, $7.00.

AXE WEDGES.

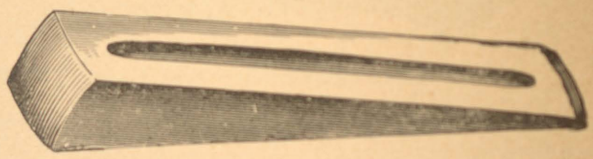
Fig. 61.



Price, per dozen, 75 cents.

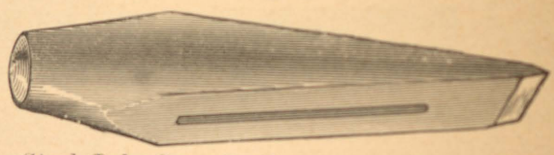
WOOD CHOPPER'S WEDGES.

Fig. 62



Steel, Standard Pattern, per lb.....
Iron, " " " .....

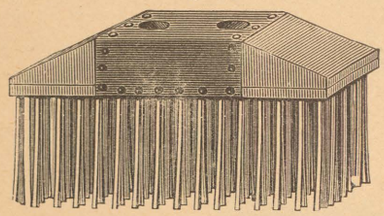
Fig. 63.



Steel, Lake Superior Pattern, per lb.....

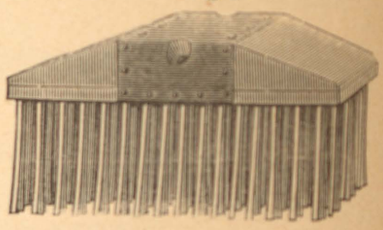
ENGINEER'S STEEL WIRE BROOMS.

Fig. 64.



No. 1, 10 inch, price per dozen	.....	$ 8 00
No. 2, 12 inch, " " "	.....	10 00
No. 3, 14 inch, " " "	.....	12 00

Fig. 65



MILL BROOMS.

Fig. 66.

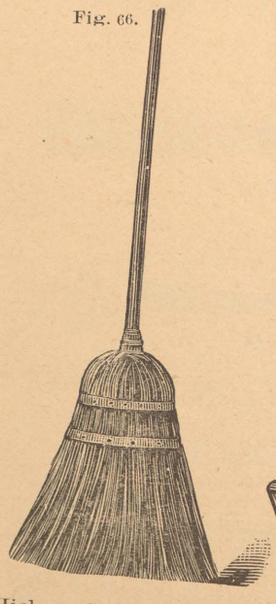


Fig. 67.

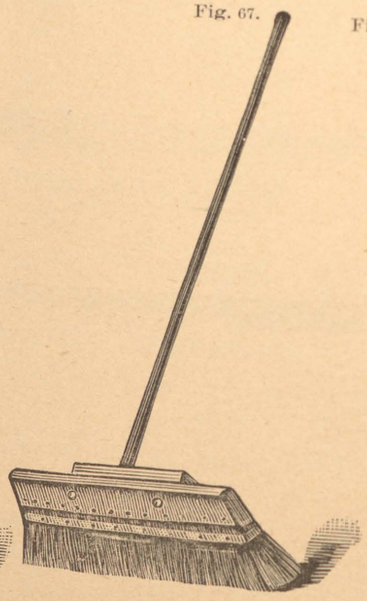


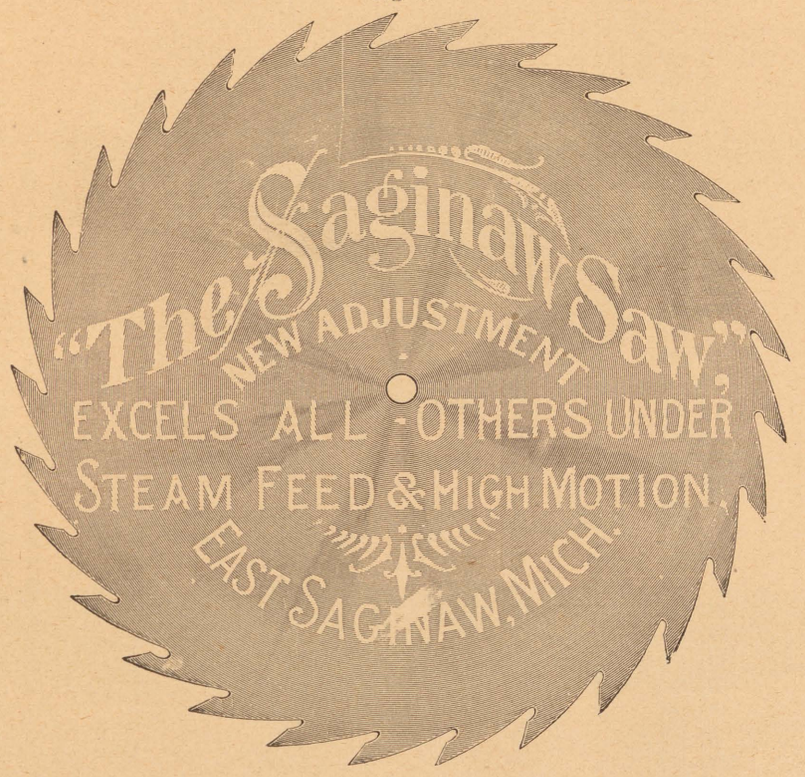
Fig. 68.

Indian Corn outside, Hickory Splints inside, Heavy Iron Bands, Figure 66, per dozen	$4 00
Round Splint Brooms, Figure 68, per dozen	1 75
Mill Scrub Splint, 12 inches, Figure 67, per dozen	5 00
Mill Scrub Splint, 14 inches, " " "	6 00

SAWS.

CIRCULAR MILL SAWS.

Fig. 69.



STANDARD GAUGE.

Gauge No. 4, $\frac{1}{4}$ inch scant.	Gauge No. 8, $\frac{5}{32}$ inch full.	Gauge No. 11, $\frac{1}{8}$ inch scant.	Gauge No. 14, $\frac{5}{64}$ inch full.
" " 5, $\frac{7}{32}$ "	" " 9, $\frac{5}{32}$ " scant.	" " 12, $\frac{7}{64}$ "	" " 15, $\frac{5}{64}$ " scant.
" " 6, $\frac{13}{64}$ "	" " 10, $\frac{1}{8}$ " full.	" " 13, $\frac{3}{32}$ "	" " 16, $\frac{1}{16}$ " full.
" " 7, $\frac{3}{16}$ " scant.			

WHEN ORDERING CIRCULAR SAWS GIVE THE FOLLOWING SPECIFICATIONS.

Diameter of Saw.
Thickness of gauge of Saw at rim.
Thickness of gauge of Saw at center.
Number of Teeth in Saw.
Style of Teeth.
Right or Left Hand Saw.
Size of Mandrel Hole.
Size of Pin Holes.
Distance between Pin Holes from center to center.
Number of revolutions per minute.
Greatest feed at each revolution of Saw.
Kind of lumber to be sawed.
Whether Spring Set or Swage.

TERMS OF WARRANTY ON SAWS.

Each Saw is warranted free from flaws and seams, and practically true.

If found defective in either of these particulars, it may be returned at shipper's expense, and if on examination by us, we are satisfied the Saw is at fault, it will be properly repaired, or a new Saw given in exchange and returned.

A Saw will not be exchanged for a new one after it has been gummed.

☞ CAUTION.—The use of a cold chisel in retoothing or altering "*Extra Cast Steel Tempered Saws*," will almost invariably crack the Saw. Saws breaking from such usage must not be considered as covered by our warranty.

☞ REMEMBER, "*That a true Mandrel will help a bad Saw, but a bad Mandrel will spoil a good Saw.*"

Any alteration in the holes of Circular Saws by filing, reaming or otherwise, will generally spring the Saw. When such alteration is made the Saw will not be subject to above warranty.

WARRANTED EXTRA CAST STEEL CIRCULAR SAWS.

(PATENT GROUND AND PATENT TEMPERED.)

Diameter.	Price Each. List.	Thickness.	Each additional Gauge. [Heavier.]	Extra for Grinding each additional Gauge.	Size of Hole.
4 inches	$ 0 80	19 gauge	$ 0 03 extra	$0 18	
5 "	1 00	19 "	0 04 "	0 20	
6 "	1 20	18 "	0 05 "	0 25	
7 "	1 40	18 "	0 06 "	0 30	
8 "	1 70	18 "	0 08 "	0 35	
9 "	2 00	17 "	0 10 "	0 40	
10 "	2 30	16 "	0 12 "	0 45	1
12 "	3 00	15 "	0 17 "	0 50	1
14 "	4 00	14 "	0 21 "	0 60	1
16 "	5 00	14 "	0 25 "	0 70	1
18 "	6 00	13 "	0 30 "	0 80	1
20 "	7 50	13 "	0 35 "	0 90	1
22 "	9 00	12 "	0 45 "	1 00	1
24 "	10 50	11 "	0 55 "	1 20	1
26 "	12 50	11 "	0 65 "	1 40	1
28 "	14 00	10 "	0 80 "	1 60	1
30 "	16 00	10 "	0 90 "	1 80	1
32 "	18 50	10 "	1 00 "	2 00	1
34 "	21 00	9 "	1 20 "	2 20	1
36 "	24 00	9 "	1 40 "	2 40	1
38 "	28 00	8 "	1 75 "	2 60	1
40 "	33 00	8 "	2 00 "	3 00	1
42 "	40 00	8 "	2 50 "	3 50	1
44 "	50 00	7 "	3 00 "	3 70	2
46 "	60 00	6 "	3 50 "	3 80	2
48 "	70 00	6 "	4 00 "	4 00	2
50 "	80 00	6 "	4 50 "	4 20	2
52 "	90 00	5 "	5 00 "	4 30	2
54 "	100 00	5 "	6 00 "	4 50	2
56 "	115 00	5 "	7 00 "	4 70	2
58 "	135 00	5 "	8 00 "	4 80	2
60 "	160 00	5 "	9 00 "	5 00	2
62 "	185 00	4 "	10 00 "	5 20	2
64 "	210 00	4 "	12 00 "	5 40	2
66 "	235 00	4 "	15 00 "	5 50	2
68 "	260 00	4 "	18 00 "	5 70	2
70 "	295 00	3 "	21 00 "	5 90	2
72 "	335 00	3 "	24 00 "	6 00	2

No extra charge for Saws one gauge thicker than list; one gauge beveling being allowed on all Circular Saws.

CIRCULAR TOP SAWS FOR DOUBLE MILLS.

Size, inches,	24	26	28	30	32	34	36
Price, List,	$13 00	$15 00	$18 00	$21 00	$24 00	$27 00	$31 00

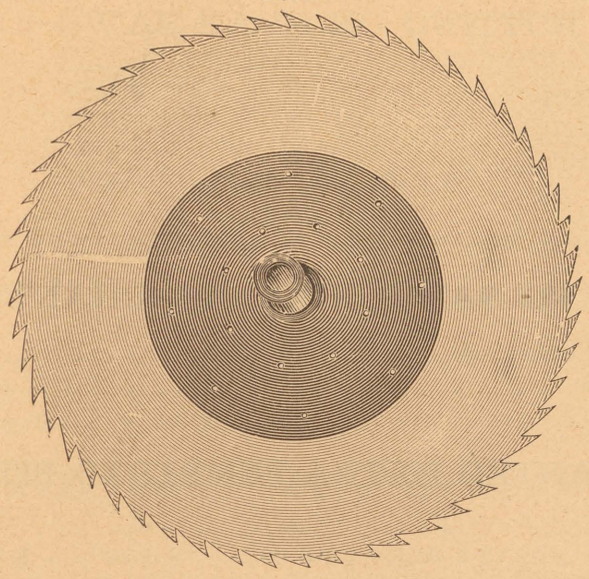
SHINGLE SAWS.

WHEN ORDERING SHINGLE SAWS GIVE FOLLOWING SPECIFICATIONS.

Whose make Machine. Diameter of Saw. Thickness of Saw at rim. Thickness of Saw at center. Number of Teeth in Saw. Right or Left Hand Saw. Size of Mandrel hole. Diameter of collar. Is Saw to be fitted to new or old collar. If to be fitted to old collar, send the old collar to us, that we may drill Saw to fit it. If new collar is to be used, do you wish us to furnish it. If you wish us to furnish new collar, and same is only to be a plain collar, state its diameter and thickness. If new collar is not a plain one, send us an exact draft of it, or, better, if possible, send us an old collar for a pattern. Is collar to be attached with screws or rivets. If attached with screws, either send a screw or give size of screw. Which is to be counter-sunk for Screw Head, Saw or Collar.

(*See next page for list prices.*)

Fig. 70.

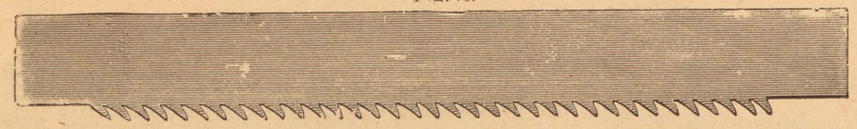


SHINGLE SAWS TAPER GROUND.

30	32	34	36	38	40	42	44	46	48 inches.
$26 00	$29 00	$32 00	$35 00	$40 00	$46 00	$56 00	$67 00	$78 00	$90 00 each.

CAST STEEL MULAY SAWS, No. 1.

Fig. 71.



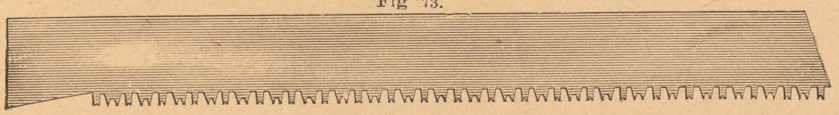
		4 gauge.	5 gauge.	6 gauge.	7 gauge.	8 gauge.	9 gauge.
10 inches wide, price per foot,	List,	$2 15	$2 00	$1 85	$1 65	$1 50	$1 35
11 " " " " "	"	2 40	2 20	2 05	1 85	1 60	1 45
12 " " " " "	"	2 65	2 40	2 25	2 00	1 80	1 60

CAST STEEL BUTTING OR DRAG SAWS.

Fig. 72.

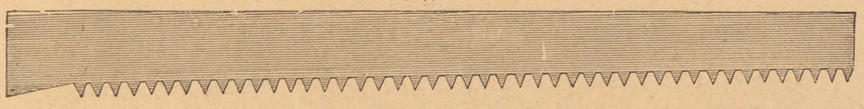
MILL TOOTH.

Fig 73.



CHAMPION TOOTH.

Fig. 74.



CROSS-CUT TOOTH.

Tapered 7 inch butt, 5 inch point, 10 gauge,	List,	$ 90 per foot
" 7 " " 5 " " 11 "	"	85 "
" 8 " " 6 " " 10 "	"	1 00 "
" 8 " " 6 " " 11 "	"	95 "
Equal width, 8 inches wide, 10 "	"	1 00 "

In ordering Drag Saws, specify style of Tooth wanted.

CAST STEEL BUTTING OR DRAG SAWS—LANCE TOOTH.

	6 guage.	7 guage.	8 guage.	9 guage.	10 guage.
Tapered, 8 inch butt, 6 inch point	.....	.....	$ 1 30	$ 1 20	$ 1 10 per foot.
Equal width, 8 inches wide	.....	.....	1 40	1 30	.....
" " 10 " "	.....	$ 1 85	1 65	1 50	.....
" " 11 " "	$ 2 20	2 05	1 85	.....	.....
" " 12 " "	2 40	2 25	.....	.....	.....

Tapered Saws over 8 inches wide, same price as equal width.

GANG SAWS, NO. 1. WARRANTED.

Nos. 10, 11, 12, 13, 14 guage, 8 inches wide ..... $1 00 per foot.
15, 16 guage, 8 inches wide ..... 90 "
Each additional inch in width ..... 10 "

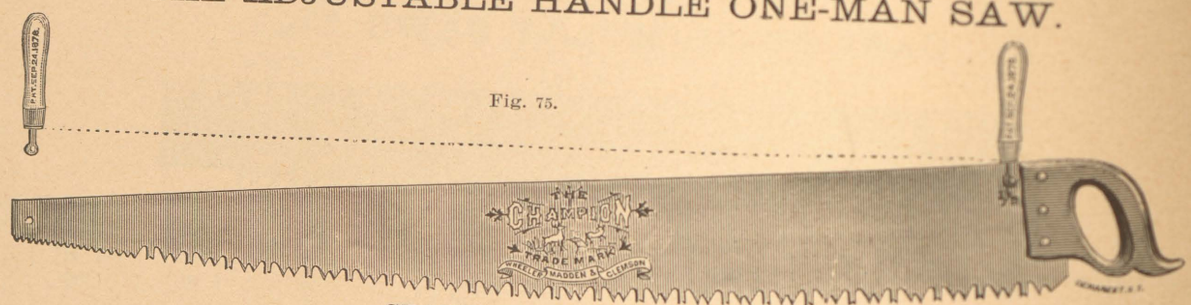
WARRANTED EXTRA-TEMPERED PIT-SAWS.

Length	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8 feet
Price, each	$ 5 50	$ 6 00	$ 6 50	$ 7 00	$ 7 50	$ 8 00

Pit Saw Handles, with boxes complete, each 2 25

THE ADJUSTABLE HANDLE ONE-MAN SAW.

Fig. 75.



STANDARD LENGTH 4 FEET.

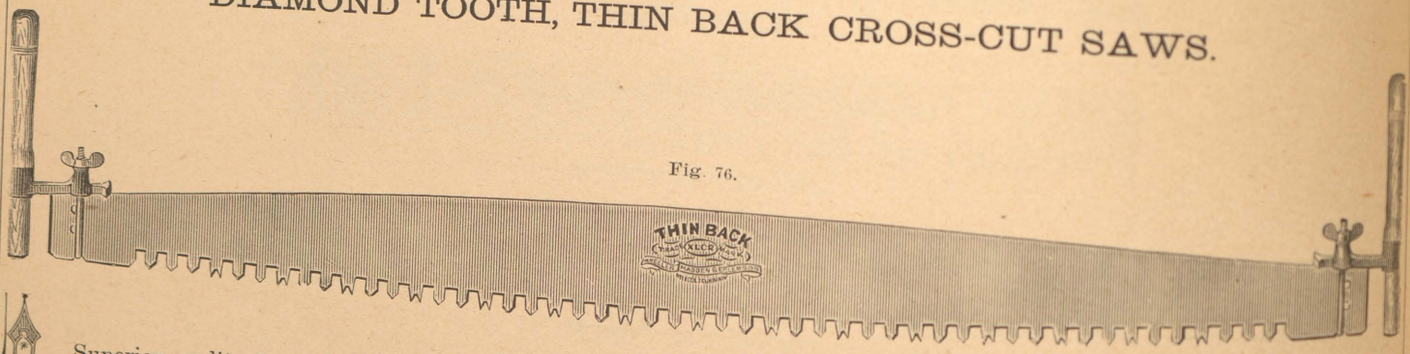
$3\frac{1}{2}$ foot blade, each $2 75
4 " " 3 00
$4\frac{1}{2}$ " " 3 50

WITH PATENT ADJUSTABLE ATTACHMENT.

The only Saw that can be adjusted for either a One-Man or a Two-Man Saw.

DIAMOND TOOTH, THIN BACK CROSS-CUT SAWS.

Fig. 76.



Superior quality Cast Steel Warranted; ground four gauges thinner on back than on tooth. Extra, Filed and Set, per foot $0 75

CHAMPION TOOTH CROSS-CUT SAWS.

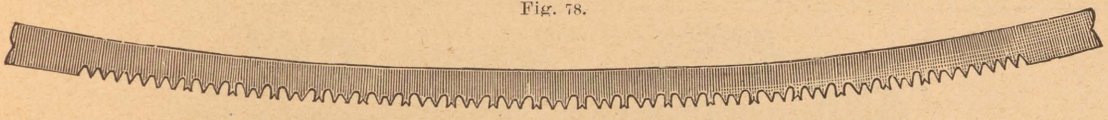
Fig. 77.

Common Back, Cast Steel, Warranted; Filed and Set, price per foot..... $.....
Champion Thin Back, Superior Quality Cast Steel, Warranted; ground four gauges thinner on back than on tooth, price per foot..... .....
Champion Extra Thin Back, Extra Quality Cast Steel, Warranted, price per foot..... .....

The Saginaw Saw—Cross-Cut—Common Back, price per foot..... .....
" " " —Thin Back, price per foot..... .....
" " " —Extra Thin Back, price per foot..... .....

CURVED BACK CROSS-CUT SAWS.

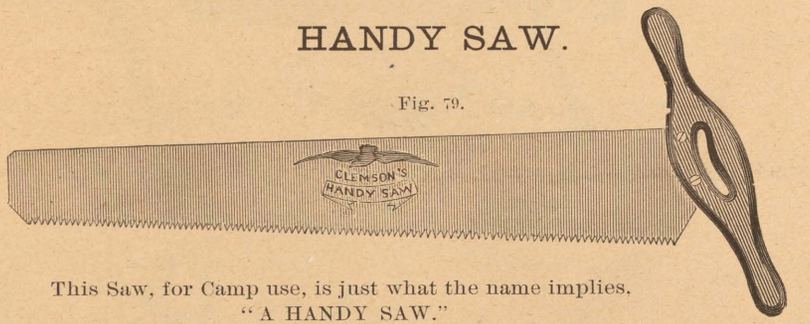
Fig. 78.



Superior Quality Cast Steel, Warranted, price per foot..... .....

HANDY SAW.

Fig. 79.



This Saw, for Camp use, is just what the name implies.
"A HANDY SAW."

Price, per dozen..... $12 00

CROSS-CUT SAW HANDLES.

Fig. 80.

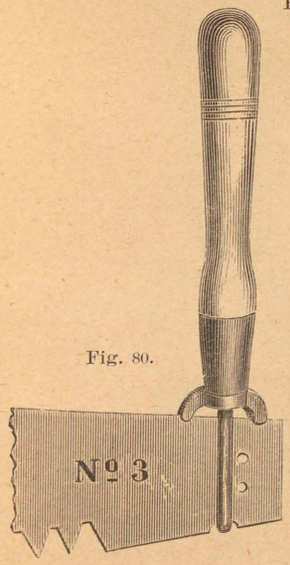
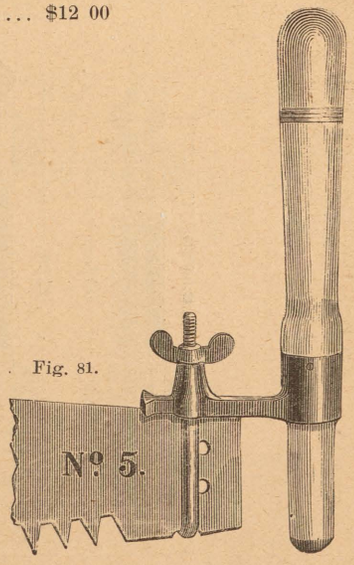


Fig. 81.

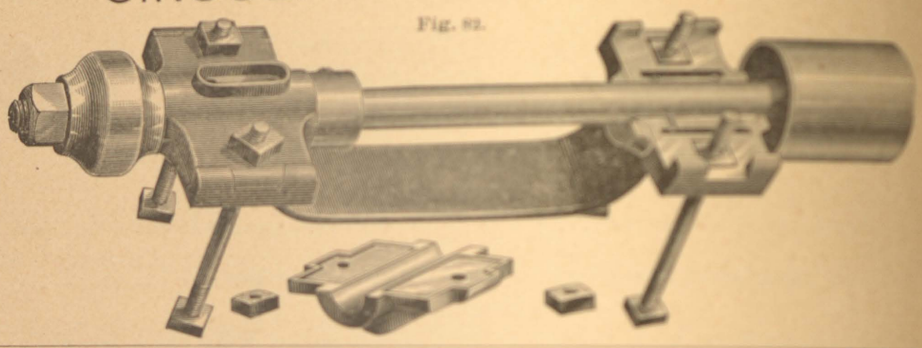


Wheeler, Madden and Clemson's No. 3, per pair....$ 0 45
" " " " No. 5, " 50
Atkins'..... 50

CIRCULAR SAW MANDRELS.

WITH PULLEY ON END.

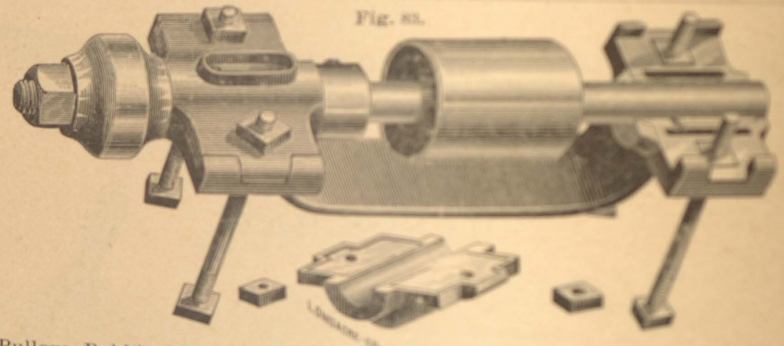
Fig. 82.



NUMBER.	Price of Pulley on End.	Price of Pulley in Center.	Diam. of Pulley. Inches.	Face of Pulley. Inches.	Diam. of Flange. Inches.	Size of Hole in Saw.	Diameter of Shaft. Inches.	Length of Shaft. Pulley on End.	Length of Shaft. Pulley in Center.	Space from Saw to Bolt.
0	$ 8 00	$ 7 00	2¼	3	2	⅝	15-16	16	10	4
1	10 00	9 00	2½	3½	2¼	⅝	1 1-16	20½	17	5
2	13 00	12 00	3½	4	3½	1	1 3-16	25	22	6½
3	17 00	16 00	4½	5½	4½	1¼	1 7-16	29½	26½	7½
4	22 00	20 00	5½	6½	5½	1½	1 11-16	33½	27	9
5	28 00	26 00	6	7	6	1¾	1 15-16	37	30	10

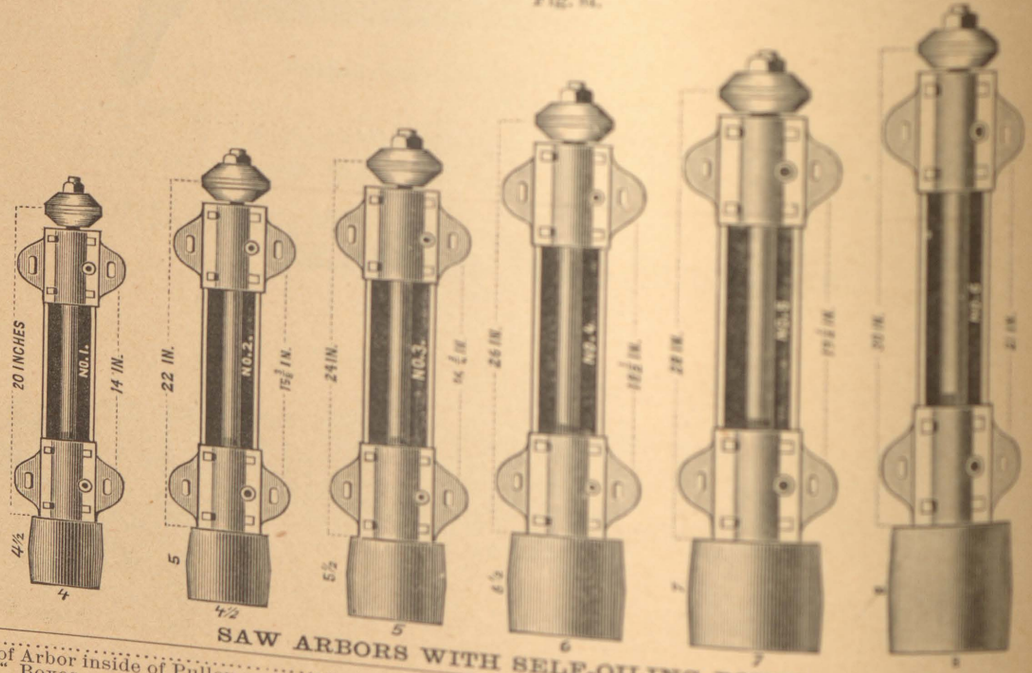
WITH PULLEY IN CENTER.

Fig. 83.



These Mandrels are with Pulleys, Babbited Boxes and Bolts. Pulley always on right hand side with left hand thread, unless otherwise ordered.

Fig. 84.



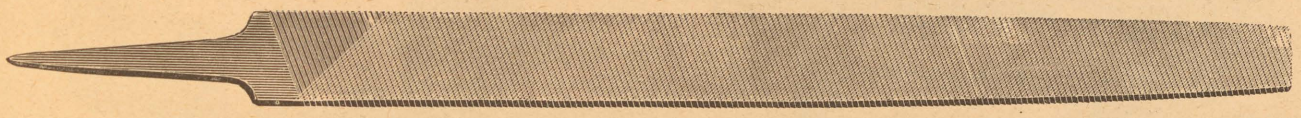
SAW ARBORS WITH SELF-OILING BOXES.

Numbers	1	2	3	4	5	6
Lenghth of Arbor inside of Pulley and Saw	20 inches	22 inches	24 inches	26 inches	28 inches	30 inches
" Boxes	5 "	5½ "	6 "	6½ "	7 "	7½ "
Size of Pulley, Diameter and Width	4X4½	4½X5	5X5½	6X6½	7X7	8X8
Price, each	$14 00	$17 00	$20 00	$23 00	$26 00	$30 00

FILES AND RASPS.

Price List of Files and Rasps Adopted by the File Manufacturers' Association of the United States, as their Selling List.

Fig. 85.



MILLSAW, ROUND, AND SQUARE.

INCH.	Bastard.	2d Cut.	Smooth.
4	$ 1.40	$ 1.65	$ 1.75
5	1.60	1.85	2.00
6	1.85	2.10	2.35
7	2.20	2.55	2.80
8	2.65	3.05	3.30
9	3.15	3.65	3.95
10	3.80	4.35	4.75
11	4.50	5.20	5.60
12	5.35	6.15	6.70
13	6.40	7.35	8.00
14	7.65	8.75	9.55
15	9.10	10.50	11.40
16	10.80	12.40	13.50
17	12.60	14.55	15.75
18	14.70	16.90	18.40
19	17.10	19.70	21.35
20	19.70	22.70	24.65

EXTRAS.
Mill Double Cut and Mill Pointing advance 1 inch.

FLAT AND WARDING.

INCH.	Bastard.	2d Cut.	Smooth.
4	$ 1.50	$ 1.75	$ 1.90
5	1.70	2.00	2.15
6	2.00	2.35	2.55
7	2.40	2.80	3.05
8	2.90	3.35	3.65
9	3.50	4.00	4.35
10	4.15	4.75	5.20
11	4.80	5.60	6.05
12	5.80	6.65	7.25
13	6.85	7.90	8.55
14	8.15	9.40	10.20
15	9.75	11.20	12.20
16	11.55	13.30	14.45
17	13.60	15.65	17.00
18	16.00	18.45	20.00
19	18.75	21.55	23.40
20	21.80	25.10	27.30

EXTRAS.
Cants (Double) advance 2 inches.
Feather Edge, do. adv. 3 inches.

HAND, HALF-ROUND, PILLAR AND 3-SQUARE.

INCH.	Bastard.	2d Cut.	Smooth.
4	$ 1.60	$ 1.85	$ 2.00
5	1.85	2.10	2.35
6	2.20	2.55	2.80
7	2.65	3.05	3.30
8	3.15	3.65	3.95
9	3.80	4.35	4.75
10	4.50	5.20	5.60
11	5.25	6.05	6.60
12	6.25	7.20	7.80
13	7.35	8.50	9.20
14	8.75	10.10	10.95
15	10.35	11.90	12.95
16	12.25	14.10	15.35
17	14.55	16.75	18.20
18	17.25	19.90	21.60
19	20.30	23.40	25.40
20	23.90	27.50	29.90

EXTRAS.
Knife and High Back Hlf. Rd., adv. 1 inch.
Cross and Slotting, adv. 2 inches.

WOOD FILES AND RASPS.

INCH.	Cabinet Files & Rasps.	Hlf. Round Wood Rasps.	Flat Wood Rasps.
6	$ 2.90	$ 2.55	$ 2.35
7	3.50	3.05	2.80
8	4.20	3.65	3.35
9	5.00	4.35	4.00
10	6.00	5.20	4.75
11	7.00	6.05	5.60
12	8.25	7.20	6.65
13	9.65	8.50	7.90
14	11.30	10.10	9.40
15	13.15	11.90	11.20
16	15.40	14.10	13.30

FLAT WOOD FILES
take Flat Bastard Price.

HALF ROUND WOOD FILES
take ½ Rd. Bastard Price.

SAW FILES.

INCH.	Taper Single Cut.	Taper Double Cut to Point.	Slim Taper Single Cut.	Slim Taper Double Cut to Point.	Pit Saw Blunt Single Cut.	Band Saw Taper Single Cut.	Hook Tooth Blunt Single Cut.	Double End Tapers with H'ndl.
3	$ 1.05	$ 1.35	$ 1.15	$ 1.45	$ 1.50	$ 1.70		Length is same as Number.
3½	1.05	1.35	1.15	1.45	1.50	1.70		
4	1.20	1.50	1.25	1.55	1.60	1.85		
4½	1.35	1.75	1.40	1.75	1.70	2.05		No. 7 $ 2.10
5	1.60	2.00	1.55	1.95	1.85	2.35		
5½	1.85	2.35	1.75	2.20	2.10	2.65		
6	2.15	2.75	2.05	2.55	2.45	3.00	$ 2.65	No. 8 2.40
7	2.75	3.45	2.45	3.10	3.15	3.70	3.15	
8	3.45	4.30	3.00	3.75	3.95	4.50	3.80	
9	4.30	5.40	3.65	4.55	4.80		4.50	No. 9 2.70
10	5.35	6.70	4.50	5.60	5.80		5.25	
11	6.60	8.25	5.55	6.90	6.85		6.15	
12	8.00	10.00	6.85	8.55	8.00		7.10	No. 10 3.20
13	9.55	11.95	8.40	10.50				
14	11.30	14.15	10.35	12.90				

Extras. **Round Off** takes Hook Tooth Price.
Round Gulleting takes Pit Saw Price.
Tapers Single Cut to Point advance 1 inch.

HORSE AND SHOE RASPS.

INCH.	HORSE. Plain Rasps.	HORSE. Beveled Rasps.	HORSE. Tanged Rasps.	SHOE. Half Round Rasps.	SHOE. Flat Rasps.	SHOE. Last Makers' Rasps.
6				$ 2.45	$ 2.00	
7				2.65	2.40	
8				3.10	2.90	
9				3.75	3.50	
10	$ 4.65	$ 5.35	$ 6.30	4.60	4.10	
11	5.35	6.30	7.55	5.70	4.85	
12	6.30	7.55	9.00	7.00	5.80	$ 9.00
13	7.55	9.00	10.80			10.50
14	9.00	10.80	12.80			12.10
15	10.80	12.80	15.00			
16	12.80	15.00	17.60			
17	15.00	17.60				
18	17.60					

OVAL SHOE RASPS.

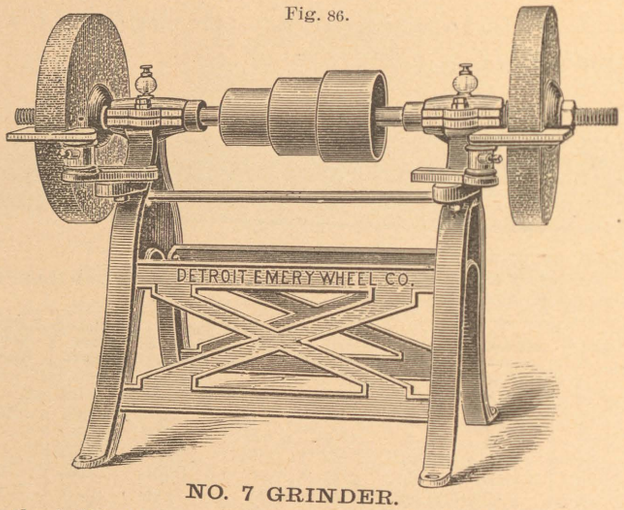
6	Inch.	$ 3.15
7	"	3.40
8	"	3.95
9	"	4.75
10	"	5.80
11	"	7.10
12	"	8.70

EXTRAS (GENERAL).

One Round Edge advances 7½ per cent., and Two Round Edges, 15 per cent. on respective Kinds and Cuts.
Dead Smooth, double the price of Bastard Cut. Equalings (Bellied), advance 2 inches on respective Kinds and Cuts.
Rough, Coarse, or other than Regular Cuts (except those herein provided for), which are made upon Standard Shaped Blanks, also Blunt Files, advance 1 inch on respective Kinds and Cuts.
Sizes Below 4 Inches, not extended, take price of 4 inch; and ½ inches not specified take next higher full in. price.
All lengths above those listed, and Files varying from Standard Sizes, shall be classed as Irregular Goods, and be subject to special prices.

EMERY WHEELS, GRINDERS AND DRESSERS.

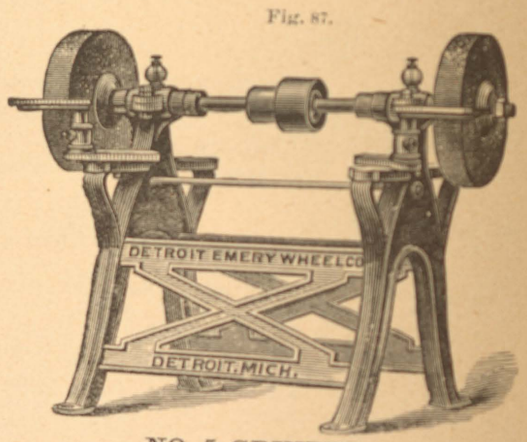
Fig. 86.



NO. 7 GRINDER.

Length of Mandrel,	5 ft. 4 in.
Diameter of "	2 in.
Cone on "	10, 8 and 6 in.
Diameter of Collars,	8 in.
Counter Shaft Cone,	16, 18 and 20 in.
Tight and Loose Pulley,	12x6 in.
Weight, complete,	815 pounds.
Price,	$120.

Fig. 87.



NO. 5 GRINDER.

Length of Mandrel,	4 ft.
Diameter of "	1½ in.
" of Collars,	6 in.
Cone on Mandrel,	6 and 4 in.
" on Counter Shaft,	14 and 16 in.
Tight and Loose Pulley,	10x4 in.
Weight,	455 pounds.
Price,	$75.

Fig. 88.

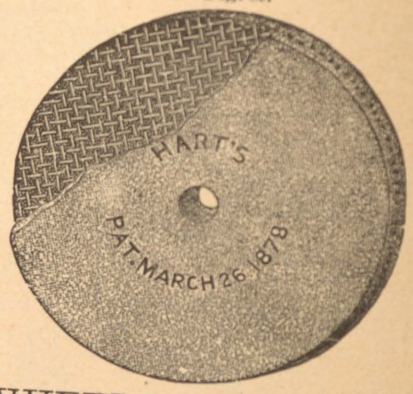
THE

HUNTINGTON EMERY WHEEL DRESSER.

For Trimming, Shaping and Removing Gloss from Emery Wheels.

With two Sets of Cutters, ... $4.00

Fig. 89.



PRICE LIST OF EMERY WHEELS.

Thickness of Wheels, In.	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2	2½	3	3½	4	
3	$ 50	.....	$ 75	.....	$ 95	$ 1 10	$ 1 25	$ 1 35	$ 1 45	$ 1 60	$ 1 85	$ 2 10	$ 2 60	$ 3 00	7,400
4	80	.....	1 10	.....	1 35	1 60	1 90	2 20	2 50	2 75	3 25	3 85	4 60	5 00	5,450
5	1 00	.....	1 40	.....	1 80	2 10	2 60	3 00	3 45	3 80	4 65	5 40	6 40	7 40	4,400
6	1 40	.....	1 75	.....	2 50	3 05	3 70	4 30	5 00	5 60	6 90	8 25	9 50	11 00	3,600
7	1 85	.....	2 30	.....	3 15	3 95	5 00	5 60	6 40	7 25	8 90	10 55	11 10	12 60	3,150
8	2 12	$ 2 36	2 60	$ 3 10	3 60	4 50	5 70	6 40	7 60	8 30	10 20	12 05	14 00	16 00	2,750
9	.....	.....	3 15	3 50	3 85	4 90	6 80	8 05	9 25	10 50	12 95	15 40	19 00	21 75	2,450
10	3 00	3 35	3 70	4 40	5 10	6 60	8 10	9 50	11 00	12 40	15 35	18 15	21 00	23 80	2,200
12	3 50	3 75	4 00	5 00	6 00	7 40	9 00	10 70	12 75	14 05	17 40	20 75	24 25	27 50	1,850
14	.....	.....	6 20	7 45	8 70	10 70	13 25	15 20	17 80	19 50	24 20	26 75	28 70	30 70	1,600
16	.....	.....	.....	.....	11 00	13 70	16 90	19 40	22 00	25 00	30 80	36 50	43 00	48 75	1,400
18	.....	.....	.....	.....	13 75	17 00	21 75	24 50	28 75	32 00	39 50	47 00	54 50	62 00	1,256
20	.....	.....	.....	.....	.....	20 00	25 00	29 00	34 00	38 00	47 00	56 00	66 00	75 00	1,100
22	.....	.....	.....	.....	.....	.....	29 87	35 50	41 12	46 75	58 00	69 25	80 50	91 75	1,000
24	.....	.....	.....	.....	.....	.....	.....	43 00	50 00	57 00	71 00	85 00	99 00	113 00	925
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	87 50	109 00	131 00	153 00	175 00	735
36	.....	.....	.....	.....	.....	.....	.....	.....	.....	127 00	157 00	188 00	219 00	250 00	550

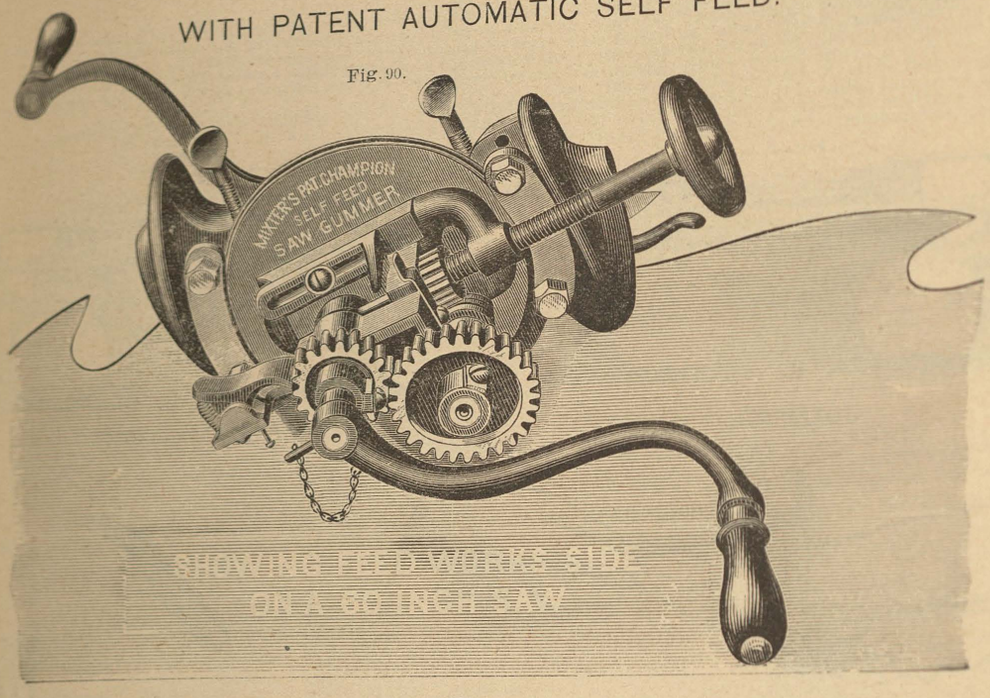
Diameter in Inches. — *Number of Revolutions per Minute.*

Always give exact size of Mandrel, and the kind of work to be done.

CHAMPION GUMMER

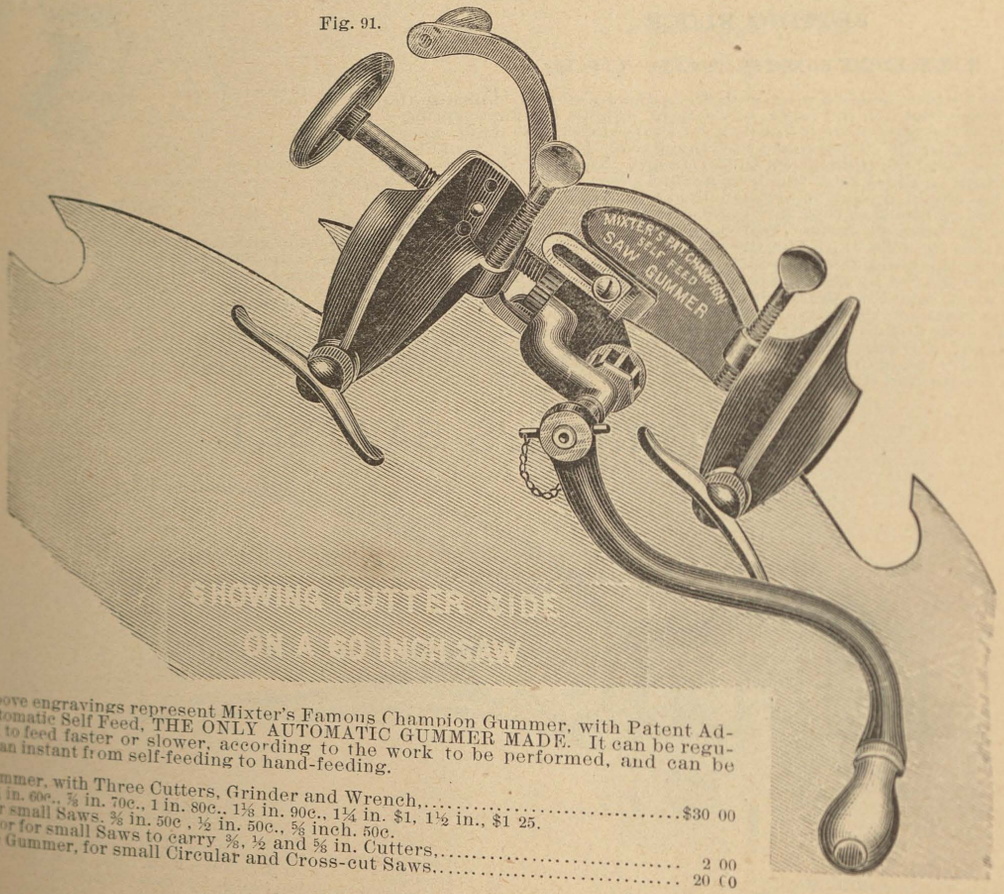
WITH PATENT AUTOMATIC SELF FEED.

Fig. 90.



SHOWING FEED WORKS SIDE ON A 60 INCH SAW

Fig. 91.



SHOWING CUTTER SIDE ON A 60 INCH SAW

The above engravings represent Mixter's Famous Champion Gummer, with Patent Adjustable Automatic Self Feed, THE ONLY AUTOMATIC GUMMER MADE. It can be regulated at will to feed faster or slower, according to the work to be performed, and can be changed in an instant from self-feeding to hand-feeding.

Price of Gummer, with Three Cutters, Grinder and Wrench,.....$30 00
Cutters, ¾ in. 60c., ⅞ in. 70c., 1 in. 80c., 1⅛ in. 90c., 1¼ in. $1, 1½ in., $1 25.
Cutters for small Saws, ⅜ in. 50c , ½ in. 50c., ⅝ inch. 50c.
Extra Arbor for small Saws to carry ⅜, ½ and ⅝ in. Cutters,..... 2 00
Small size Gummer, for small Circular and Cross-cut Saws..... 20 00

ATKIN'S SAW TOOLS.

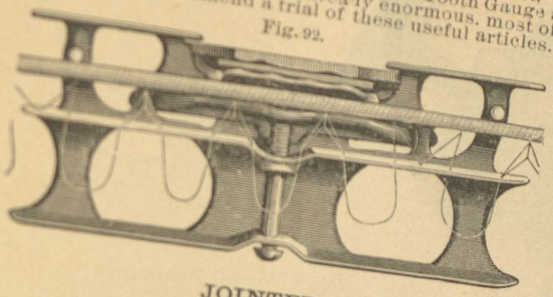
To meet the requirements of users of Cross-Cut Saws who have experienced so much difficulty in the use of the numerous Sets that have been thrown upon the market, we have devised a set of tools, comprising a Combined Jointer and Tooth Gauge, Setting Block and Set Gauge, by the aid of which Cross-Cut Saws may be kept in much better order than is possible without. The value of the Setting Block will be readily estimated, as it is well known that Saws having a proper temper cannot be safely filed with a wrench, or by any of the contrivances that hitherto have been made for the purpose; while with our Setting Block, Saws of very high temper, and of the finest steel, can be easily set.

The convenience and value of the Jointer, Tooth Gauge and Set Gauge will be apparent from the illustrations.

The demand for these tools is already enormous, most of the orders coming to us without solicitation.

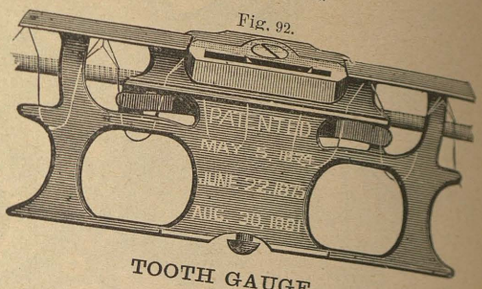
We earnestly recommend a trial of these useful articles.

Fig. 92.



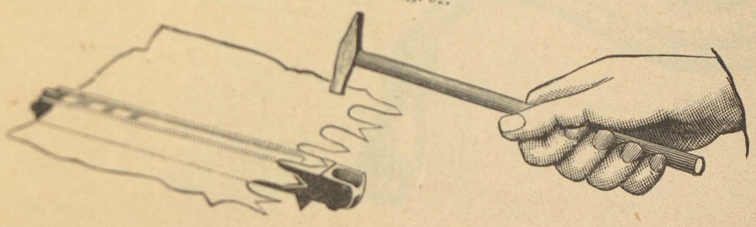
JOINTER.

Fig. 92.



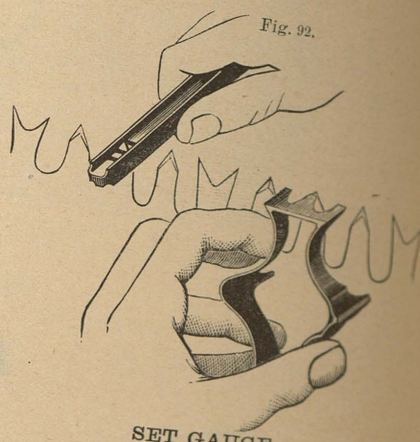
TOOTH GAUGE.

Fig. 92.



SETTING BLOCK.

Fig. 92.



SET GAUGE.

DIRECTIONS FOR USE.

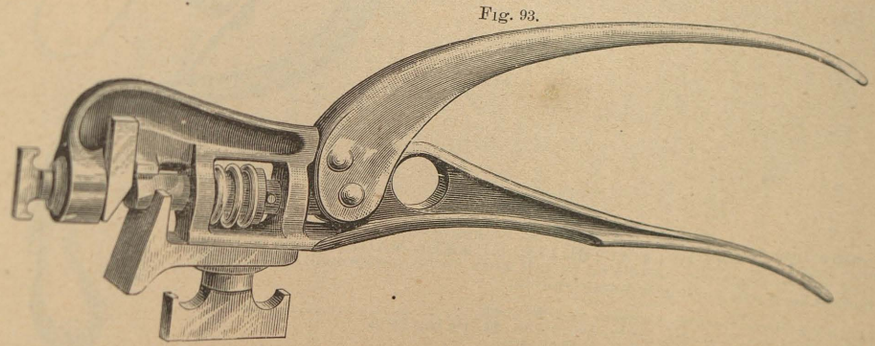
In using the Jointer, place a nine-inch file in the Jointer as shown in the cut; clamp the piece that has the large screw tight against the file to spring it to suit the curve of the Saw, pass it lightly over the points of the teeth until it touches the shortest tooth. Then place the Gauge over the cleaner drag teeth, as indicated in cut; and file them down to the Gauge. Now if the Saw requires setting, lay the Setting Block or Wrench on a solid piece of plank or end of a block of wood, bevel side up and short end towards you. (See cut.) Lay the Saw upon the Setting Block so that the point of the tooth to be set, projects over the apex of the beveled surface full one-quarter of an inch, bringing the point of the tooth to the line scored on the face of the Block. The tooth being in position give two or three strokes with a light hammer over the apex, near the point of each tooth to be set on that side of the Saw. Then turn the Saw over and set the other side in the same manner. Regulate the Set by gauging each tooth with the Tooth Gauge or Gauge at either end of the fork in the Setting Block. If the Tooth Gauge is used, take it in the left hand and placing it against the side of the Saw. (See cut.) As the point of Gauge farthest from you indicates the least set, the next indicates a little more, and so on. Use the wrench in the right hand, place it on the tooth, lift up to set the tooth and bear down to take the set out.

Adjust to point of Gauge desired, according to timber. The Saw is now ready for sharpening.

Notice carefully the manner in which the Saw is filed when new, and file as near as possible in the same manner. Point the clearers by filing square across, and then bevel to an edge. Do not bevel too flat, as no advantage is obtained, and the tooth is thereby weakened.

MORRILL'S SAW SET.

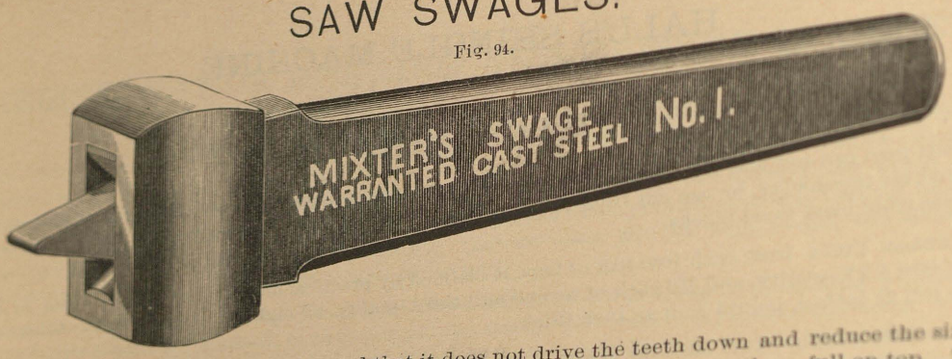
Fig. 93.



Atkin's Saw Tools complete, (set)	$ 75	True's Patent Cross-Cut Saw Sets, each	$1 00
Atkin's Double Saw Gauge, each	15	Leach's Cross-Cut Saw Sets, 13 in. long, each	1 50
Morrill's No. 1 Hand Saw Sets, each	1 00	Stillman's Genuine Cross-Cut Saw Sets, each	75
Morrill's No. 4 Cross-Cut Saw Sets, each	1 50	Boynton's Cross-Cut Saw Sets, each	1 00
Bemis & Call's Cross-Cut Saw Sets, 12 in. long, each	1 25	Smith's Mill Circular and Cross-Cut Saw Sets, each	1 50
Aiken's Genuine Hammer Saw Sets, each	$1 00		

SAW SWAGES.

Fig. 94.



Mixter's Double Upset Swage is so constructed that it does not drive the teeth down and reduce the size of the Saw like most of the Upsets in use, but it draws the teeth out from the under side and leaves them full on top. The great demand for Mixter's Swage is a guarantee of its superiority over other Upsets in the market. They have been in use for the last ten years, and give perfect satisfaction.

It is the strongest and most durable Swage that can be made—the largest one (No. 3) weighing one pound and eight ounces, and will outlast a half-dozen of the common small kind.

There is no instrument that can be put into a sawyer's hands that is so useful as a suitable Swage for properly spreading the points of saw teeth.

DIRECTIONS.

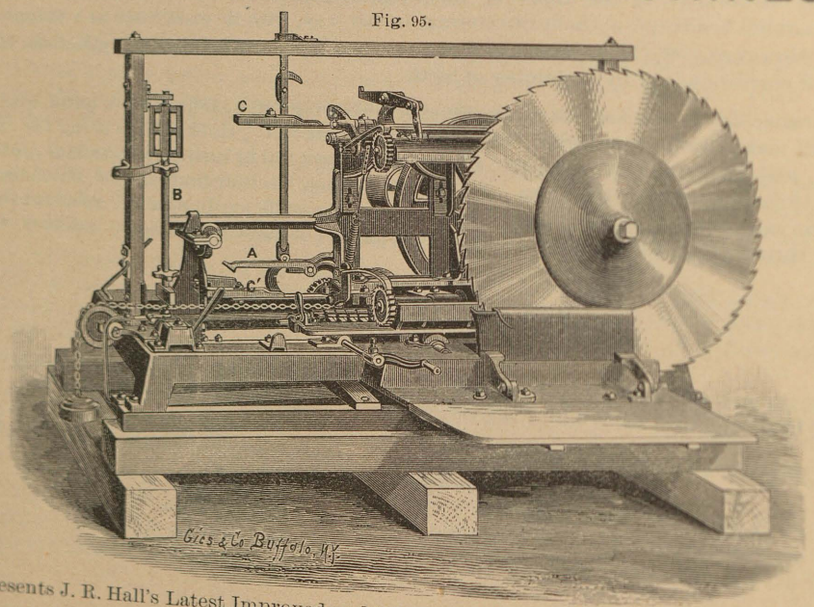
First see that the teeth are sufficiently hooking, so that the Swage can spread them at the points, leaving a short bevel of about one-eighth of an inch wide on the under side. Do not try to swage blunt teeth. Either the teeth must be filed to fit the Swage, or the dies to the Swage must be ground to fit the teeth. Use the rounding die first—placing the Upset on with the long or middle die on top of the tooth, and down flat so as to steady the Upset, and give it the same angle each time. After the teeth are spread, use the flat die to point with. The edge of the teeth will need no filing, except occasionally a slight touch. By raising or lowering the end of the Swage, the point of the tooth may be turned up or down as desired. One drop of oil on the bottom of the Swage will prevent undue friction, and assist materially the operation of swaging. Try it and be convinced.

PRICE LIST.

No. 3, Double Swage,	largest size,	for Saws of from 5 to 10 gauge,	$7 00
No. 2, "	"	medium " " " 8 to 12 "	6 00
No. 1, "	"	for all thinner gauges,	5 00
No. 0, "	"	for small thin Saws,	4 00
No. 00, "	"	for very small thin Saws,	3 00
No. 1, Side File (or Saw Tooth Jointer.)			1 50
No. 2, " "		for Saws with long Teeth or inserted Teeth,	1 75
Swage Bars, Steel, all sizes, per lb.,			

SHINGLE AND HEADING MACHINES.

Fig. 95.



This cut represents J. R. Hall's Latest Improved and 6th Pattern Self-Acting Shingle and Heading Machine.

For Description and Prices see Pages 28, 29 *and* 30.

HALL'S SHINGLE MACHINE.

CAPACITY AND CAPABILITY OF THE MACHINE.

One expert man can saw and joint from 10,000 to 12,000 eighteen inch shingles per day of ten hours; or, if the shingles be jointed for the sawyer, he can cut from 25,000 to 30,000 eighteen inch shingles per day from soft wood blocks, or one-third less from hard wood blocks.

THE AVERAGE YIELD from each 1000 feet of logs, is claimed by practical manufacturers of shingles, to be 5500 shingles, realizing 4000 XXX quality, and 750 each of second and third quality, all eighteen inch shingles; thickness being five butts measure full 2¼ inches, points $\frac{1}{10}$ of an inch thick.

OUR LARGE MACHINE.—This Machine is same style in every respect as the 6th pattern, excepting its extra size and strength of parts. It has capacity for a saw 44 inches diameter, and to cut shingles and heading from 16 inches to 26 inches long.

DESCRIPTION AND MERITS OF THE MACHINE.

FOR UNIFORMITY OF THICKNESS of butts and points, and smoothness of surface, the Machine has no equal. The changes to different thicknesses and different lengths are made in a moment's time, and without changing the uniformity of taper or evenness of butts and points.

ALL PARTS OF THE MACHINE, including screw holes in the saws, are duplicated, so that duplicate saws and duplicate parts for repairs can be promptly supplied at all times.

THE DRIVING BELT can lead to the Machine from any direction in the plane of the driven pulley on the Machine.

PROPER SPEEDS FOR THE MACHINES.

6th pattern Machine, 1300 to 1400. Pulley 12 inches in diameter for 7 inch Belt.
The Large " 1100 to 1200. " 14 " " " 8 " "

☞ Different sized Pulleys furnished instead if desired.

The Machine, left to its self-operating device, cuts alternate butts and points, but by a simple and easily operated device, two or more butts or points in succession may be taken from either end of the bolt, thus giving the sawyer absolute control of the work, in keeping the rift of the timber vertically in line of saw.

The Machine can be changed in a few minutes so as to saw different thicknesses or different lengths of shingles, without changing the uniformity of the taper or the evenness of the butts and points, and in as little time it may be changed so as to cut parallel headings, without interfering, in any way, with its excellence as a Shingle Machine.

THICKNESS OF SHINGLES.—We have patterns for Set-Ratchets with any number of teeth, from 32 to 46 inclusive, each marked with a number corresponding to its number of teeth.

With a 16 gauge saw, No. 36 Ratchet will make shingles measuring full 3 inches to five butts, with points full $\frac{1}{32}$ thick; and No. 45 Ratchet will make 5 butts to measure $1\frac{7}{8}$ inches, with points full $\frac{1}{16}$ thick—these being the extremes of thick and thin. No. 41 Ratchet, with 16 gauge Saw, will make 5 butts to measure full 2¼ inches, with points $\frac{1}{10}$ of an inch thick, which we regard a standard 18 inch shingle in Michigan. We send with each Machine four sets of Ratchets, viz: Nos. 39, 40, 41 and 42, which gives the sawyer quite ample range to keep his shingles sufficiently near the standard thickness (or quite a percentage thicker or thinner than the standard), with varied gauges of Saws. Additional ratchets will be a matter of special order.

TAPER OR PARALLEL HEADING.

The following is the extreme limit of capacity as to the *width* of Heading, when cut to the several lengths named below. The practical limit of width should be regarded as 2 to 3 inches less than this extreme limit:

Large Machine, with 44 inch Saw.		*6th Pattern, with 40 inch Saw.*	
26 inch Heading	15 inches wide.	22 inch Heading	13½ inches wide.
24 " "	16½ " "	21 " "	14½ " "
22 " "	16½ " "	20 " "	15 " "

DIRECTIONS FOR RUNNING AND KEEPING IN ORDER.

To Make Good Shingles, the saw must be kept in good order. It matters not how perfectly any Machine may work, a saw that is dull, out of round, unevenly set, or that runs untrue, cannot make smooth, nice work. Keep the teeth straight on the back from point to throat, and keep the throat well opened, as on the dressed saw which is shipped with the Machine. Never allow the teeth to become hump-backed and short-pointed, unless in cutting knotty, frozen timber. The set is an important matter, and needs watching. The saw must also be kept round, and should be jointed frequently, *and swaged often enough to keep good corners on the teeth.*

Should the Machine make shingles of unequal thickness, when the saw is *known* to be running properly, the friction on the feed-rolls should be increased, so as to prevent the shingle bolt from being thrown out too far when the carriage comes back against the stops, which would be the result if the rolls were loose enough to turn easily. The carriage should have sufficient weights or force of spring to bring it back in contact with the stops every time.

To Make the Points and Butts of proper relative thickness, take from the Machine as they are made a dozen or more shingles, and observe from which end of the bolt come the thick and which the thin points. If those at one end of the bolt are right and the other too thick, the pawl that sets the thick point should be loosened and moved a little towards the end of the arm of the bent lever (Nos. 26 and 27), and in the opposite direction if the points be too thin—it being understood that a change of the pawl towards the pivot of bent lever makes thicker points, and from the pivot, thinner points. If necessary, more stroke can be given the pawl by moving the pin in the heavy end of the bent lever.

If the Machine makes shim (feather-pointed or uneven) shingles, it is caused by a tendency that is in all shingle saws to lead *into the bolt*, and more so at the butt of the shingle than at the point, thus making the butt too thick, and consequently the next point too thin. The remedy will be to dress the saws so as to draw outward sufficiently to overcome this tendency. Some saws need more of this kind of dressing than others.

The Beveled Trucks under the Carriage are adjustable. If the bolt presses too hard against the saw, the front truck should be moved away from it a little, or both trucks may be moved a little in opposite directions. When the bolt runs too much from the saw, it may be remedied by similar means. But when any such difficulty as this is found to exist, do not move the carriage until it is ascertained that the trouble is not in the saw.

SETTING UP THE MACHINE.

Before Putting the Saw on, be very careful to effectually clean the dirt out of the hub of the saw flanch, and from its bearing on the mandrel.

FOUNDATION.

A Correct Idea of the Foundation may be obtained from the cut. The timbers should be eight or ten inches square, and firmly gained and keyed together, and the whole well secured to the floor timbers. Then the skids attached to the Machine bolted to them at each corner. The Machine must have a good foundation. As to the height of foundation, the bottom of the skids attached to the Machine should set fifteen inches above the floor.

To Saw Plain Parallel Headings, tie up or take off the catch A, which allows the upright set-shaft G to remain stationary. Then lengthen the wood-piece (C or C′) on either one of the set-rods, so that both ends of the block will be set alike. If No. 39 Ratchets (with pawls set to catch four notches) do not make the heading as thick as desired, smaller numbers can be supplied. All Shingle Machines will cut parallel headings by making above changes.

Taper Heading Attachments, for sawing heading for tight barrels. For this we send a pair of Taper Feed-Rolls, with an upper Feed-Roll *Jaw*, and an extra bearing for attaching the Taper Feed-Roll to lower *Jaw*. Also, an extra pair of Set-rods with single incline, and three pairs of Set-Ratchets, viz: Nos. 34, 36 and 38. For these Attachments an extra charge will be made of $25.00.

To Prepare the Machine to Cut Taper Headings, remove the straight Feed-Rollers, the upper Feed-Roll Jaw, the up-right Set-Shaft, and the Double Incline Set-Rods. Then attach the Taper Feed-Roll Jaw, and the *lower bearing* for Taper-Roll. Then put the Taper-Rolls in place, with their proper Set-Ratchets on; connect up the Pawls, put in the Single Incline Set-Rods, and the Machine is ready for work.

The taper given to the heading is ½ inch in 12 inches. A piece that is 12 inches wide, and 1¼ thick on one edge, will be ¾ thick on the other edge. The sawyer will soon learn to place blocks in the Machine to vary the thickness as he desires, to accommodate narrow or small blocks,—the extreme thickness attainable with No. 34 Ratchet being 1¼ inches, and any thickness thinner that may be desired.

HALL'S SHINGLE MACHINE.

6th PATTERN PRICE LIST.—FOR MACHINES COMPLETE UP TO THE MAIN DRIVING BELT.

6th Pattern Machine, Easy Range from 14 to 20 Inch Shingles.

Machine with 36 inch Saw, without Jointer	$ 315 00
" " 38 " " " "	320 00
" " 40 " " " "	325 00
Additional for extra 36 inch Saw fitted to extra Flange	38 00
" " " 38 " " " " "	42 00
" " " 40 " " " " "	47 00
" " Single Jointer complete (one 41 inch wheel, 6 knives)	35 00
" " Double " " (two 41 " wheels, 6 " each)	80 00

LARGE MACHINE. EASY RANGE FROM 16 TO 26 INCH SHINGLES.

Machine with 42 inch Saw, without Jointer	$ 360 00
" " 44 " " " "	370 00
" " 46 " " " "	380 00
Additional for extra 42 inch Saw fitted to extra Flange	55 00
" " " 44 " " " " "	65 00
" " " 46 " " " " "	75 00
" " Single Jointer complete (one 52 inch wheel, 6 knives)	45 00
" " Double " " (two 52 " wheels, 6 " each)	100 00
" " extra Saw Collars (or Flanges) 18 inches diameter, 18 screw holes	9 00
" " " " " " " 20 " " " 24 " "	10 00
" " Taper Heading Attachment on either Machine (see page 29)	25 00

CIRCULAR SAW JOINTERS.

This Jointer does much better work than the Knife Jointer, and increases the yield from a given quantity of timber about 10 per cent. It, however requires an extra hand for each Shingle Machine in a mill.

DOUBLE SAW JOINTER, on wood frame, with two 16 inch saws on one mandrel, each saw provided with a light iron Carriage, neatly fitted to planed iron ways. The carriages can be placed on either side of the saws, to work right or left hand. Price, with one extra saw (three 16 inch saws in all) $ 125 00

EXTRA FOR COUNTER SHAFT AND PULLEYS, driven from the Jointer Pulley on Shingle Saw Mandrel, Arbor Pulley 4½ inches for 4 inch belt. Speed about double that of Shingle Saw. 10 00

FOR A KNOT SAW MACHINE, with one 16 inch Saw, a single Machine substantially same style as above. 65 00

PRICE LIST OF REPAIRS

FOR No. 5 IMPROVED AND No. 6 HALL SHINGLE MACHINE.

Main Frame	$ 30 00	Crooked Lever, or rear Post	35
Bed Piece of Carriage (old style, with ways	12 00	Cap for Crooked Lever	15
" " (present style, without ways)	6 00	Bumper Box Casting	50
Back Piece of Carriage, with ways	8 00	Gum for Bumper Box (or Rubber Bumpers	40
" " Large Machine	16 00	Strap Rod	40
Upper Jaw	4 00	Trip Hook for Strap Rod	20
Stands for Ways (babbitted), 12" high, each	2 60	Strap Roller	50
" " 15" " "	3 00	Shieve Roller	85
Stand for Mandrel Frame	3 00	Cap for Shieve Roller ("P")	25
" " " Large Machine	4 50	Buttons, each	25
Mandrel Frame (babbitted)	6 00	Bolt for Buttons	25
" " " Large Machine	12 00	Wood Spring	35
Caps for Mandrel Frame (babbitted), each	2 00	Brace Casting for front Post	40
" " " " Large Machine, each	3 00	Rollers for Carriage	1 25
Gib Cap for Stand, at Mandrel end	50	Coil Pull Spring (for Rack Bar)	50
" " back end	50	Four and one-half inch Feed Cone on Saw Mandrel	3 00
Small Cap for Stand, Mandrel end	25	Five and one-half inch " "	4 50
" " back end	25	Ratchets, 34, 36, 37 and 38 notch, each	50
Crank for Jaw Hoisting Shaft	50	" 39, 40, 41 and 42 "	65
Jaw Hoisting Shaft	60	" 43, 44, 45 and 46 "	75
Arm on Hoisting Shaft, with Set Screw	35	Feed Rolls, per set of 2	15 00
Upright Rod for Hoisting Rig	40	Spurs for Feed Rolls, per set of 24	5 00
Hook Casting (or No. 29 Casting)	15	Washers for " " 20	5 00
Rotating Set Shaft	2 25	Coil Spring for Upper Jaw, each	75
Spring for Set Shaft	25	Weight	1 50
Spring Support	25	Pawl for Rotating Set Shaft	30
Lower Support for Rotating Set Shaft	60	Turned Pin for Nos. 26 and 27	50
Gum Bumper on rear Stand	60	" " Trip Lever	35
Bolt and Wood Cone for rear Stand	35	" " Nos. 14 and 15	25
Ten inch Gear Wheel	1 50	" Stud Bolt for Pawl	40
Shaft for " (1¼")	2 25	" " " No. 21	40
Shaft for " (1")	2 00	" " " " 19	40
Ten inch Cone Feed Wheel	4 50	" " " " 11	50
Shaft for Feed Wheel (1¼")	2 25	" " " " 24	40
Shaft for " (1")	2 00	" " " Saw Guard	50
Rack Bar, 30½" long ("R")	1 20	" " " Top Jaw	

PRICE LIST OF REPAIRS FOR No. 5 IMPROVED AND No. 6 HALL SHINGLE MACHINE (Continued).

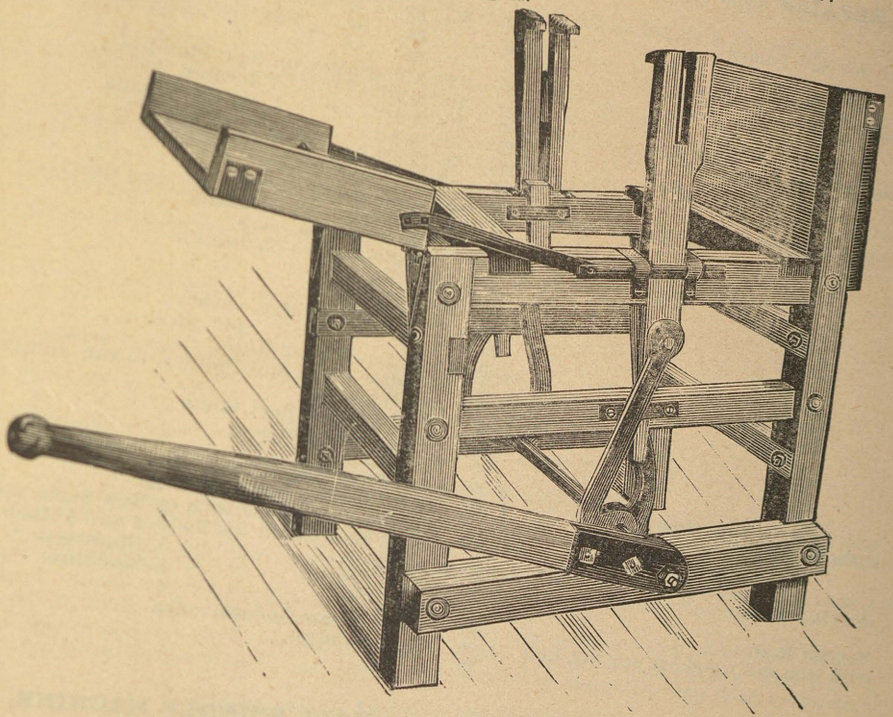
No. 0	Casting (Ear for Saw Guard)	$	15
" 2	"		20
" 3	"		35
" 4 and 5	Castings, each		20
" 6	Casting		20
" 7	"		30
" 8	" (Ear for Saw Guard		15
" 10	"		20
" 11	"		30
" 12	"		35
" 13	"		25
" 14	"		30
" 15	"		30
" 16	"		20
" 17	"		20
" 20	"		50
" 21	"		30
" 22	"		50
" 23	"		15
" 24	"		75
" 25	"	1	25
" 26	"		80
" 27	"		80
" 29½	"	2	50
" 30	" with Ears (or Saw Guards)	2	00
" 30	" without Ears "	1	00
" 31	"		20
" 32	"		50
" 47	" (Pawl)		30
" 48	"		30
" 50	" (for Set Rod)		50
" 50	" with iron and wood att. (or Set Rod	1	00
" 62	"		30
No. 63	"		30
" 64	"		20
" 65	"		25
12″ x 7″	Pulley on Saw Mandrel	5	00
10″ x 4″	" " Jointer	3	25
10″ x 4″	" " Counter Shaft	3	25
10″ x 4″	" " "	2	25
7 29/32″ x 4″	" " Mandrel	2	25
	Shaft for Jointer	1	75
	Nut for Saw Mandrel		70
	Wrench for Saw Mandrel		50
	Jointer Knives, each		50
	Shingle Square on Jointer		35
	Saw Set		25
	Saw Gauge		25
	Screws for Flange, each	3	25
	" " per gross		67
	Bolt for Jointer Knife	6	00
	Counter Shaft and Pulleys, to run Jointer	10	00
	Fly Wheel	15	00
	41″ Jointer Wheel, alone	10	00
	41″ Jointer Frame		50
	Trip Lever		35
	Coil Push Spring		50
	End Ferrules for Feed Rolls		50
	Pinions, 1½ inch, 2 inch or New Style, each		90
	18 in. Saw Collar for No. 3, 4 and 5 Mach. not drilled	9	00
	20 " " " " " 5, Improved " " "	10	00
	20 " " " " " 6 Machine " " "	10	00
	22 " " " " " 6 " " "	12	00
	Drilled Saw Collars, extra	1	00
	Saw Mandrel	15	00

PRICE LIST OF REPAIRS FOR NO. 3 HALL SHINGLE MACHINE.

Main Frame	$22 00
Front part of Frame	15 00
Bed Piece of Carriage	12 00
Upper Jaw	4 00
Feed Rolls, complete, per set of two	15 00
Washers or Spurs for Feed Rolls, per set	5 00
Backbar, (22½ in. long, letter "F")	80
Pinions (long and short) each	50
Monkey-Tail Lever (Letter "N")	1 00
Large Feed Cone on Saw Mandrel, (4½ in.)	3 00
Small Feed Cone on Saw Mandrel	1 50
10 inch Gear Wheel	2 00
Saw Guard with Ears	1 25
Rear Casting for Strap-Roller and Shieve	1 75
Trip Lever	1 25
Knuckles for Trip-Lever and Spring	35
Trip-Spring	1 00
Short part of Trip-Spring	30
Long Elliptic Spring	3 00
Buffer-Rod (malleable)	1 25
Buffer-Rod Bearings, each	35
Trip-Spring Support	35
Wrought Iron Braces, each	75
Shaft for Cone Pulley	1 00
Shaft for Gear Wheel and Pinion	2 00
10, 11 and 12 Notch Ratchets, each	45
13 and 14 Notch Ratchets, each	50
Gum Bumper	30
Pawls, each	30
Strap-Bar (malleable)	60
Top Spring	1 00
Strap-Roller	50
Caps for small Shafts, each	35
Shieve Wheel for Chain	85
"V" Truck for Carriage	1 25
Flat Truck for Carriage	1 25
Cone Feed Pulley (10 in. diameter)	4 50
Largest Turned Stud for Pawl Casting and Monkey-Tail Lever	75
Smaller Turned Stud for Pawl Casting and Monkey-Tail Lever	60
Turned Stud for Trip-Lever	50
Small Stud for Monkey-Tail Lever	30
Casting "A"	90
" "B"	50
" "C"	1 00
" "D"	1 25
" "E"	50
" "H"	80
" "I", (Button)	20
" "J"	1 25
" "K"	80
" "L"	75
" "O", (Gib for Carriage)	15
" "P"	35
" "R"	1 50
" "SS"	2 50
" "T"	3 00
" "W"	20
" "X", (Cap)	25
" "Y"	25
" "&"	25
" "SB"	1 00
" "5B"	75
" "5R"	1 00
Jointer Knife Bolts, each	40
Jointer Knives, each	60
Weight	2 00
Cap for Feed Gear	20
Cross-Piece that Trip-Spring is bolted to	20
Chain	40
Shoe-Casting	25
Cam that works upper Pawl	75

SAGINAW SHINGLE PACKER.

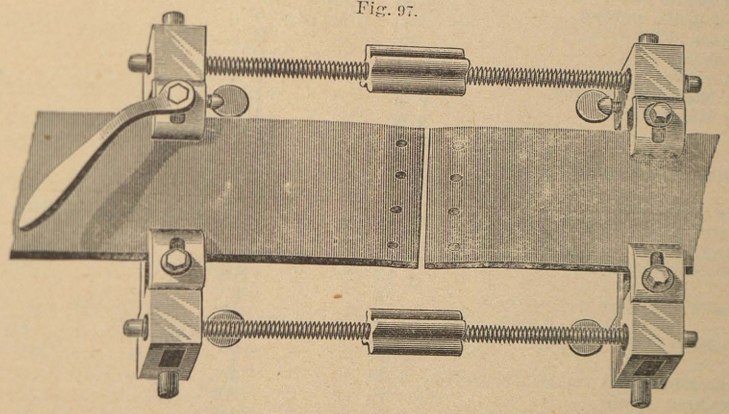
Fig. 96.



Price, each, $15 00.

THE PORTER BELT TIGHTENER.

Fig. 97.



In lacing large belts it is absolutely necessary to have some device for clamping the ends together. Since any accident to a belt, that calls for the stopping of all or a portion of the machinery of an establishment, usually has the effect to keep a number—sometimes a large number—of men idle, it is evident that any means that shall expedite the work is a matter of considerable economical importance.

The accompanying engraving represents the view of the Porter Belt Tightener, the object being to provide a cheap and effective device for the purpose, and be believe this clamp is superior in durability and price to any in the market. As will be seen, it consists of four Cast Iron Blocks, which are each provided with a Clamping Jaw, between which and the Block the two ends of the belt are held. These Jaws are provided with Clamping Bolts, by the operation of which they are made to grip the belt.

Rods of suitable length connect the Blocks together, thereby preventing them from twisting while tightening the belt, which is done by means of the right and left hand Screws. To accommodate different width of belt the Blocks are clamped in any desired positions on the Rods by means of Thumb-screws.

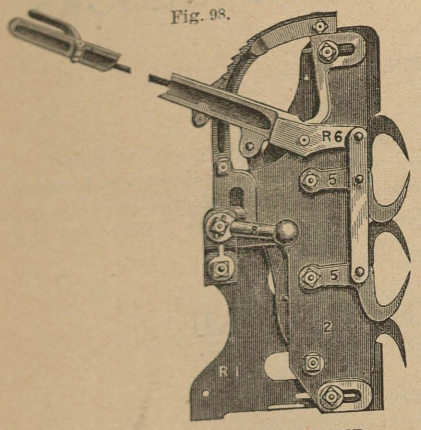
It will be seen that this Belt Tightener has great capacity, and is almost instantly adjusted to any width of belt, from two to twenty inches.

The right and left hand Screws, by the operation of which the belt is drawn together, are of sufficient length to allow the Clamps to be placed at such a distance from the ends of the belt as to leave ample room for lacing, or for applying a square to the ends, if desired. Each of the Clamps are applied separately. When advisable belt may be passed over the pulleys with Clamps attached.

Price, $12.00.

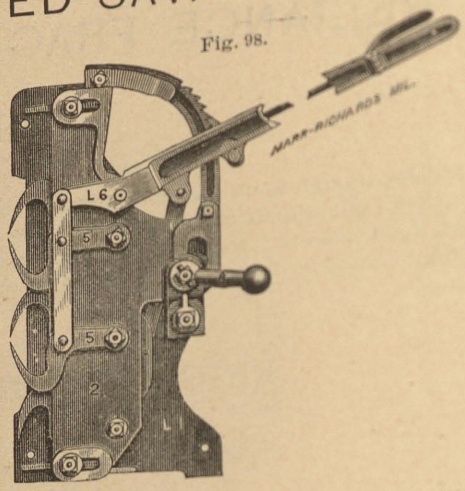
RELIANCE PATENT IMPROVED SAW MILL DOGS.

Fig. 98.



RIGHT HAND.

Fig. 98.



LEFT HAND.

The above represents the RELIANCE PATENT DOGS, both right and left.

These Dogs can be bolted on to the Standards or Knees of any Mill.

They are entirely of Cast Steel and of such strength as to warrant durability in every part. Every piece is made by *template* and can be replaced by ordering from the number.

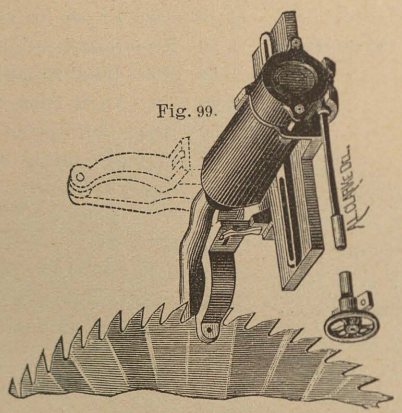
The one to the left with the Cam thrown forward, shows the Teeth in position to hold a round log.

The one to the right with the Cam thrown back, shows the Teeth in position to hold a cant or flat surface.

Net price of Dogs, $75.00.

HINKLEY'S PATENT SAW GUIDE.

Fig. 99.



Thousands of these Guides are in operation, and are proving in every day use, their entire practicability, convenience and safety.

They are strong and substantial and hold the Saw firmly.

The Arms are accurately fitted in a bored cylinder and can be turned back out of the way, when changing Saw, and dropped into position again precisely as before, and without touching or altering the adjustment.

The lateral adjustment is effected by a Worm and Wheel, which moves both Arms back or forward at the same time in the bored cylinder and without altering the space between the Saw Pins. The Worm is attached to a Rod and Hand-wheel placed convenient to the Sawyer, either forward or back of Saw, so that the adjustment can be made with perfect safety while the Saw is in motion.

The space between the Saw Pins is regulated by a Bolt on the front end of Guide.

The Guide as seen is adapted to either right or left hand Mills.

The Guide may be moved to or from the Arbor to conform to size of Saw by simply loosening two Bolts, and without disturbing the lateral adjustment.

The form of the Arms gives a wide space for the free escape of saw-dust.

Net Price Hinkley's Patent Saw Guide, $50.00

RELIANCE FRACTIONAL HEAD BLOCKS

AND SET WORKS.

These Blocks, though upon the market but a comparative short time, have had a large and wide sale. They can be found in the heavy lumber districts of Michigan, Wisconsin, Minnesota, Texas, Oregon, California and Canada, and everywhere acknowledged to be the best. Their design and construction has been the result of large practical experience and wide observation. They have replaced nearly every other style and make of Block, and the demand for them is continually increasing.

PRICE OF SET WORKS IN DETAIL.

☞ Order by List and Numbers.—All parts are Duplicates.

No.		
A 2.	Quadrant	$ 10 80
W.	Brass Dial Figured	30 00
J.	Center Pin for Dial	1 80
I.	Index Angle for Dial	30
U.	Double Box for Set Lever Shaft	6 00
B. L.	Pawl Arm, left hand	5 40
B. R.	" " right hand	5 40
13.	Long Pawls, each $1 50, per pair	3 00
14.	Short " " 1 50 "	3 00
K.	Handles to raise Pawls, each 60 "	1 20
L.	Pawl Cams, each 60 "	1 20
V.	Spring on Pawls, each 1 20 "	2 40
N.	Wrist Bolts for Pawls, each 90 "	1 80
	One Pawl Arm complete, Spring Pawl, etc	11 70
C 2.	Long Connection bet. Pawl Arm and Cross Head,	1 50
D 2.	Short " " " " " " "	1 50
F.	Set Lever	5 25
G.	Slide for Set Lever	50
P.	Pin for Slide	55
	Set Lever complete	6 35
E.	Cross-Head	9 60
M.	Wrist for Cross-Head, each, $1 10; per pair	2 20
	Set Lever Shaft 1⅞ in. x 3 ft. 10 in.	3 60
	Set Collars for Shaft, each, $1 10; per pair	2 20
R 2.	Lever Stop Arm	3 00
S.	Lever Stop	1 80
	Spring for Stop—Brass Coil	30
	Set Works complete as detailed above	103 35

No. 17.	Steel Ratchet	$ 30 00
2.	Block with Side Box and Steel Facing	75 00
2.	Common Knee comp. with Rack and Dogs	125 00
2.	" " without Dogs	80 00
2.	Taper Knee complete with Rack and Dogs	155 00
2.	" " without Dogs	110 00
1.	Block with Slide Box and Steel Facing	85 00
1.	Common Knee with Rack and Dogs	135 00
1.	" " without Dogs	90 00
1.	Taper Knee complete with Rack and Dogs	170 00
1.	" " without Dogs	125 00
Receding Friction Lever		$ 5 00
Wood Handle and Bolts		1 25
Two ⅞ Rods for Lever		50
Receding Friction Lever complete		6 75
Steel Band Brake		1 25
Two Angle Irons for Lever		80
Brass Coil Spring for Lever		75
Paper Receding Friction		5 00
Spur, 20 Teeth		1 00
" 25 "		1 25
Mitre 20		1 00
Patent Spring Pinions		12 00
Steel Coil Spring for Pinions		1 50
Double Steel Rack, 45 and 12 Teeth		13 00
" " " 39 " 12 "		11 50
Single " " 45 Teeth		8 00
" " " 39 "		7 50

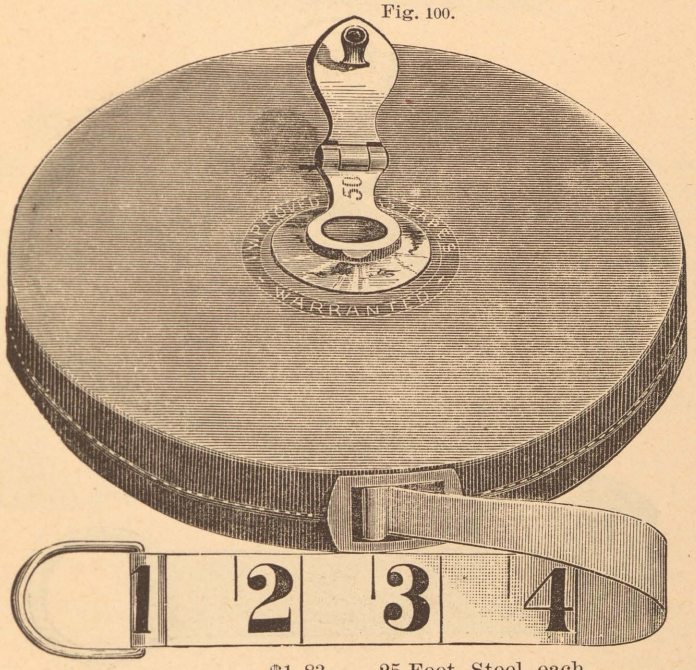
PARTS OF TAPER LEVER.

Steel Segment, No. 20, Finished	$ 7 00
Forged Lever and Bolts	1 75
Malleable Pin Way, No. 25, and Bolts	1 25
Connection Rod to Pin	75
Spring Handle, No. 24	75
Spring for Handle	50
Taper Lever Complete	$ 12 00
Center Pin for Taper Lever	2 00

MEASURING TAPES.

ROUND EDGE BEND LEATHER CASE MEASURING TAPES.

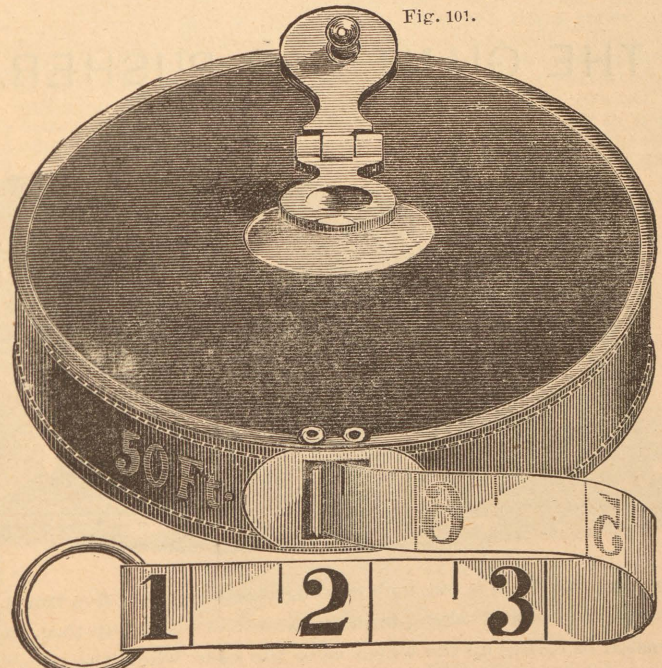
Fig. 100.



25 Feet, Metallic, each	$1 83		25 Feet, Steel, each	$ 4 25
33 " " "	2 10		33 " " "	5 60
40 " " "	2 30		40 " " "	6 40
50 " " "	2 60		50 " " "	7 60
66 " " "	3 00		66 " " "	9 80
75 " " "	3 30		75 " " "	11 20
100 " " "	4 20		100 " " "	14 40

PATENT LEATHER CASE MEASURING TAPES.

Fig. 101.

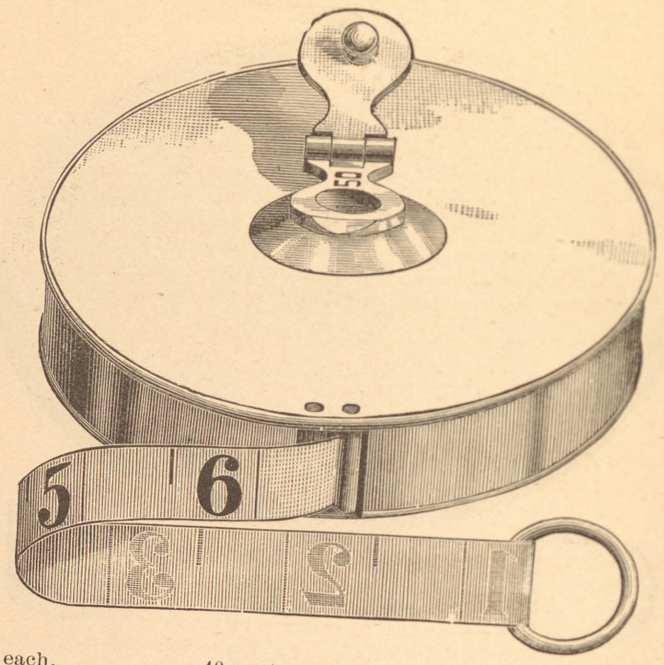


25 Feet Corded Linen Tapes, price, each	$ .45	50 Feet Corded Linen Tapes, price, each	$ .75
30 " " " " "	.50	66 " " " " "	.85
40 " " " " "	.65	75 " " " " "	1.00

100 Feet Corded Linen Tapes, price, each, $1.25.

ASSES' SKIN, BRASS BOUND CASE MEASURING TAPES.

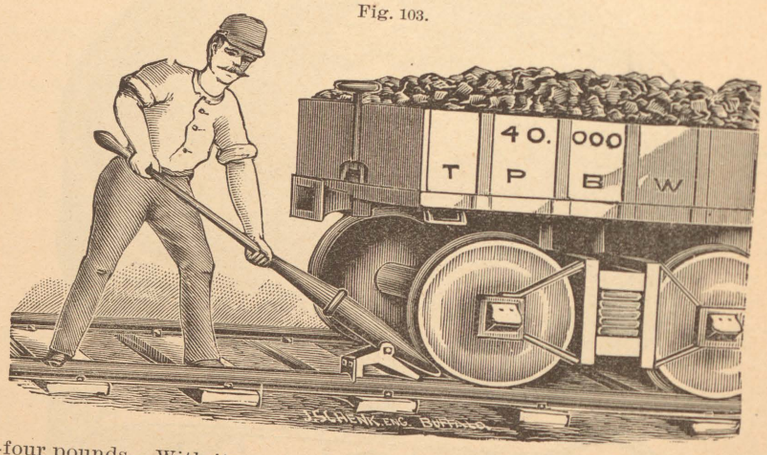
Fig. 102.



25 Feet Common Cotton Tapes, each		66 Feet Common Cotton Tapes, each	
30 " " " " "	40 cents		
40 " " " " "	40 "	75 " " " " "	65 cents
50 " " " " "	50 "	100 " " " " "	75 "
	60 "		85 "

THE GIANT CAR PUSHER.

Fig. 103.



Weight only twenty-four pounds. With it one man can increase his power five times and move twenty tons with ease. It has an immense leverage power, and taking hold on the wheel higher up than the ordinary pinch bar, is truly a "Pusher," as no power is wasted in lifting up the wheel as is the case when the pinch bar is used. Ice or grease does not hinder its operation, and it can be used at either end or middle of car. Price, each, $5.00.

PATENT STAR OIL TANK.

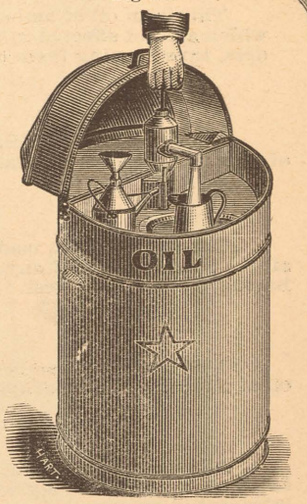
WITH DETACHABLE PUMP.

Fig. 104.

The Tank is constructed of Galvanized Iron and Japanned. Has a wood bottom underneath the metal bottom. The pump may be removed to transfer oil to the tank without loss. A removable drip pan, which will be found a clean and safe receptacle for measures and funnels. Any overflowing in filling small cans runs into the reservoir below.

A cover over all prevents accumulation of dust, evaporation and unpleasant odor of oil, and is secure from fire. The tank may be locked if desired. This is the most perfect Oil Tank in the World.

Fig 105.



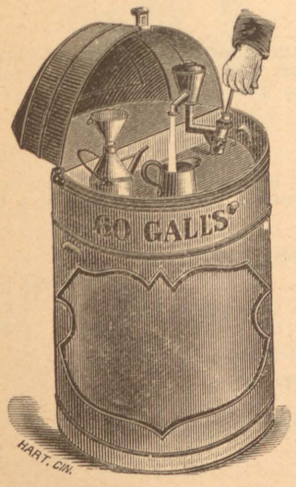
Capacity.	Diameter.	Highth.	Price.	Capacity.	Diameter.	Highth.	Price.
50 Gallons.	23 inches.	46½ inches.	$ 10 50	100 Gallons.	31 inches.	51½ inches.	$20 00
60 "	25½ "	46½ "	12 00	150 "	38¾ "	53 "	27 50
75 "	26¼ "	49 "	16 50	250 "	43 "	53 "	40 00

LUBRICATING OILS.

We call your attention to the fact that we have made arrangements with the Standard Oil Company, of Cleveland, Ohio, to represent them in their Lubricating Oils, and they have placed us in a position to sell at the same prices here as they sell at their Works. They being, as you are well aware, the largest corporation in the country—controlling the whole oil interest,—are in a position to sell good goods at prices that defy competition. As they compound all of their well known brands by eminent chemists, you can always rely upon getting the same grade under the same brand, and their name alone should be a sufficient guarantee of the excellent quality of the goods. Their Lubricating Works in which they manufacture their Oils are the American Oil Company, Backus Oil Company and Republic Refining Company.

Appreciating the fact that the public have been deceived long enough by parties who claim that they represent some Oil Company, who, when the fact is known, have no responsibility and are but "mixers" of oils, the quality of oil depending solely upon the price they receive for the same, that we feel justified in putting in a good brand of goods, believing, with the guarantee of the Standard Oil Company, and our own as well, we will receive your orders, if for no more than a sample, and we have no doubt, when once tested, we will receive a continuance of your patronage.

Fig. 106.



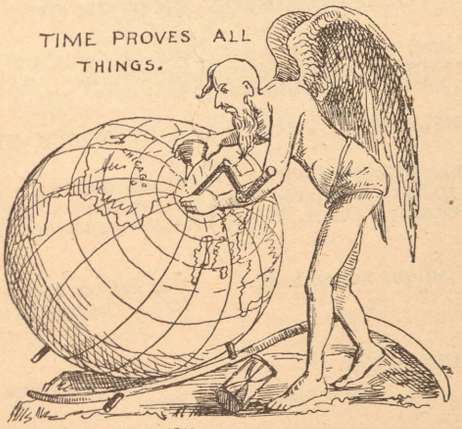
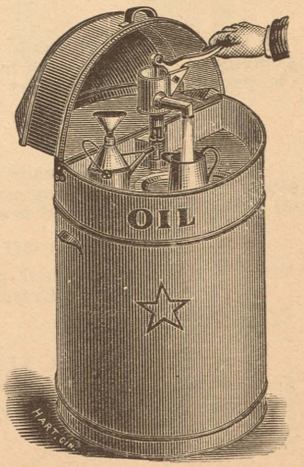


Fig. 107.



For Description and Price of Oils see next Page.

STANDARD OIL COMPANY'S LUBRICATING OILS.

CAPITOL CYLINDER OIL.

(Trade Mark.)

This is an oil of amber color, is very high fire test, and of a heavy, viscid character and great lasting properties, which are not affected in any way by the heaviest steam pressure. It will prevent corrosion or gumming up of cylinders, thus keeping them clean and in perfect condition. Price, 85c. per gallon in barrel lots.

MODEL CYLINDER OIL.

(Trade Mark.)

This is an oil of similar properties to the Capitol Cylinder, but made more especially for smaller engines. The cost of this oil being less, we can name a very low price. Price, 65c. per gallon in barrel lots.

MOTOR CYLINDER OIL.

(Trade Mark.)

This is a dark oil, made from the very choicest petroleum stock, and made by the most improved process, possessing all the requirements of any Cylinder Oil, and well adapted for locomotives or stationary engines, being of heavy body and having very high fire test. Price, 65c, per gallon in barrel lots.

SHIELD CYLINDER OIL.

(Trade Mark.)

This is an oil of amber color and resembles in appearance the Model Cylinder, but is cheaper and a most excellent oil at the price; and is adapted for general use. Price, 50c. per gallon in barrel lots.

ELDORADO ENGINE OIL.

(Trade Mark.)

A light colored oil, of exceedingly rich, heavy and viscid character, of extremely high fire test and low cold test, being the result of a long series of trials. The nature of this oil is such that it will last longer than other oils, and as a lubricant is superior to animal oils in every respect. Price, 50c. per gallon in barrel lots.

PEERLESS MACHINERY OIL.

(Trade Mark.)

This is an oil of similar color and properties to Eldorado Engine, but made for lighter machinery. It has all the properties required for lubricating the lighter grades of machinery; the cost being less than that of Eldorado, we can name a lower price. Price, 40c. per gallon in barrel lots.

GOLDEN MACHINE OIL.

(Trade Mark.)

This is a light colored oil, and used mostly for reapers and mowers. We would recommend a higher-priced oil for the purpose, but furnish this to the trade where a low-priced oil is desired. Price, 28c. per gallon in barrel lots.

CHALLENGE MACHINE OIL.

(Trade Mark.)

Another light colored oil, and is made to supply the demands for cheaper grades of machinery oil; yet we have endeavored to make it of such quality as to excel the many cheap compound oils offered on the market at the price. The quality is much inferior to our other machine oils, as the price would indicate. We therefore recommend a better grade, as being cheaper in the end. Price, 30c. per gallon in barrel lots.

BACKUS FINE ENGINE OIL.

(Trade Mark.)

This is an amber colored oil, more especially for summer use, but can be used in winter if kept in a warm place. It has given the most perfect satisfaction for sixteen years past, and is well known throughout the United States as being a reliable oil. Price, 35c. per gallon in barrel lots.

OLD DOMINION ENGINE OIL.

(Trade Mark.)

This is a black oil, made from the best natural oils, has very heavy body and great lasting properties, and is designed especially to meet a demand heretofore existing for Mecca Oil, long and favorably known, but which has long since ceased to be produced except in very limited quantity. Its cold test is five to ten above zero. Price, 45c. per gallon in barrel lots.

BLACK DIAMOND MACHINERY OIL.

(Trade Mark.)

Another black oil, made on the same principle as Old Dominion, but at a reduced cost, by which means we can name a lower price, thus enabling consumers to have a reliable black oil for general use the year round. This oil stands a low cold test of about zero and is a fine lubricator. Price, 30c. per gallon in barrel lots.

LARD OIL.

Best Pure Winter Strained, price per gallon, barrel lots,
" " Garden City Extra, " " " " "
No. 1, price per gallon, " "
" 2, " " " " "

WEST VIRGINIA LUBRICATING OILS.

Zero or Winter, price per gallon, barrel lots,
15 Deg. or Medium, price per gallon, " "
28 " price per gallon, " "
Summer, price per gallon, " "

☞ All Oils in Half-Barrels, extra for package. ☜

COLE'S BELT OIL.

Per gallon, barrel lots,	$1 25
In 5, Gallon Cans, Extra,	1 00
" 10, " " "	1 25

LINSEED OIL.

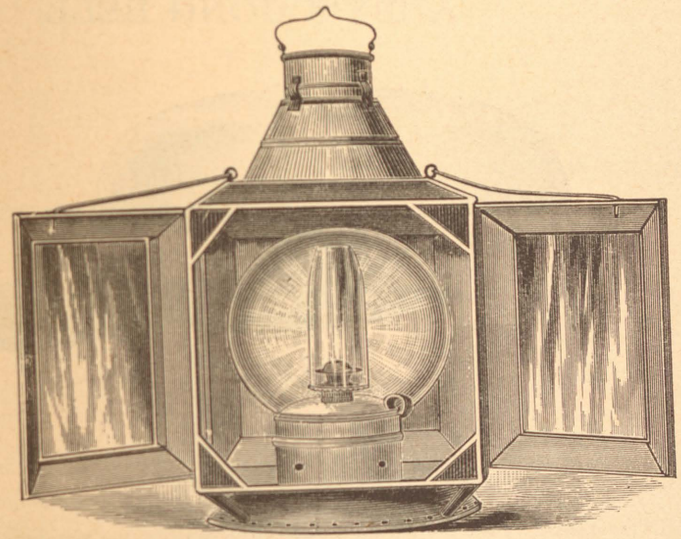
Boiled, price per gallon, barrel lots,
Raw, " " "

DIXON'S PERFECT LUBRICATOR.

1 lb. Cans, price per dozen,
5 lb. " " each,
Plumbago in bulk, per pound,

LANTERNS.

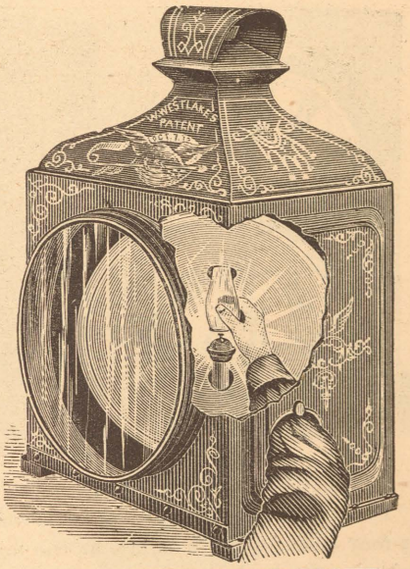
Fig. 108.



COMMON SENSE MILL LANTERN.

The Common Sense Mill Lantern is our own manufacture, and we recomend it as being the best Lantern for the price we know of, and wherever used it has given unqualified satisfaction. We use No. 3 Burner, 10-inch Reflector, and 12x14 Mirrors in Side Wings. The Lamp is protected by lights of glass on three sides. Price, $6.00.

Fig. 109.

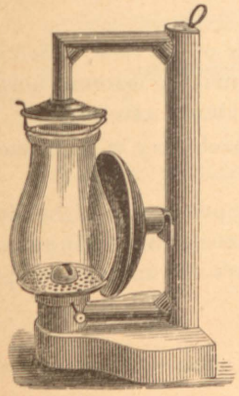


LOCOMOTIVE HEAD LIGHT FOR MILLS.

Prices, $35.00 to $75.00.

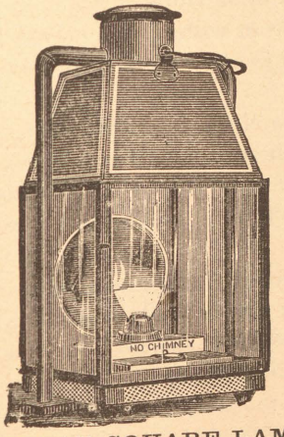
Send for Descriptions.

Fig. 110.



TUBULAR SIDE LAMP FOR CAMPS AND MILLS.

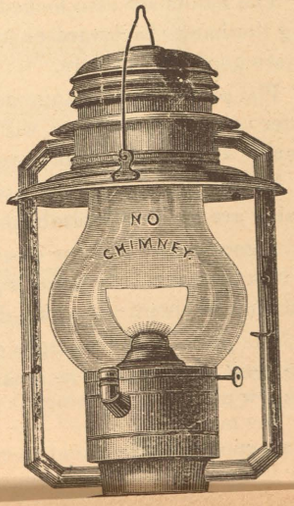
Fig. 111.



TUBULAR SQUARE LAMP.

No. 2 has No. 2 Burner, 1-inch Wick and 7-inch Silvered Glass Reflector. Height of Lamp, 22 inches. Price, $4.50.

Fig. 112.



STANDARD OIL COMPANY'S LUBRICATING OILS.

CAPITOL CYLINDER OIL.

(Trade Mark.)

This is an oil of amber color, is very high fire test, and of a heavy, viscid character and great lasting properties, which are not affected in any way by the heaviest steam pressure. It will prevent corrosion or gumming up of cylinders, thus keeping them clean and in perfect condition. Price, 85c. per gallon in barrel lots.

MODEL CYLINDER OIL.

(Trade Mark.)

This is an oil of similar properties to the Capitol Cylinder, but made more especially for smaller engines. The cost of this oil being less, we can name a very low price. Price, 65c. per gallon in barrel lots.

MOTOR CYLINDER OIL.

(Trade Mark.)

This is a dark oil, made from the very choicest petroleum stock, and made by the most improved process, possessing all the requirements of any Cylinder Oil, and well adapted for locomotives or stationary engines, being of heavy body and having very high fire test. Price, 65c, per gallon in barrel lots.

SHIELD CYLINDER OIL.

(Trade Mark.)

This is an oil of amber color and resembles in appearance the Model Cylinder, but is cheaper and a most excellent oil at the price; and is adapted for general use. Price, 50c. per gallon in barrel lots.

ELDORADO ENGINE OIL.

(Trade Mark.)

A light colored oil, of exceedingly rich, heavy and viscid character, of extremely high fire test and low cold test, being the result of a long series of trials. The nature of this oil is such that it will last longer than other oils, and as a lubricant is superior to animal oils in every respect. Price, 50c. per gallon in barrel lots.

PEERLESS MACHINERY OIL.

(Trade Mark.)

This is an oil of similar color and properties to Eldorado Engine, but made for lighter machinery. It has all the properties required for lubricating the lighter grades of machinery; the cost being less than that of Eldorado, we can name a lower price. Price, 40c. per gallon in barrel lots.

GOLDEN MACHINE OIL.

(Trade Mark.)

This is a light colored oil, and used mostly for reapers and mowers. We would recommend a higher-priced oil for the purpose, but furnish this to the trade where a low-priced oil is desired. Price, 28c. per gallon in barrel lots.

CHALLENGE MACHINE OIL.

(Trade Mark.)

Another light colored oil, and is made to supply the demands for cheaper grades of machinery oil; yet we have endeavored to make it of such quality as to excel the many cheap compound oils offered on the market at the price. The quality is much inferior to our other machine oils, as the price would indicate. We therefore recommend a better grade, as being cheaper in the end. Price, 30c. per gallon in barrel lots.

BACKUS FINE ENGINE OIL.

(Trade Mark.)

This is an amber colored oil, more especially for summer use, but can be used in winter if kept in a warm place. It has given the most perfect satisfaction for sixteen years past, and is well known throughout the United States as being a reliable oil. Price, 35c. per gallon in barrel lots.

OLD DOMINION ENGINE OIL.

(Trade Mark.)

This is a black oil, made from the best natural oils, has very heavy body and great lasting properties, and is designed especially to meet a demand heretofore existing for Mecca Oil, long and favorably known, but which has long since ceased to be produced except in very limited quantity. Its cold test is five to ten above zero. Price, 45c. per gallon in barrel lots.

BLACK DIAMOND MACHINERY OIL.

(Trade Mark.)

POST'S WATER-PROOF BELT OIL AND LEATHER PRESERVATIVE.

TRADE POST MARK.

This can be used either on wet or dry Belting, and will preserve Leather in damp places as well as dry.

Price, per gallon, ... $1 50

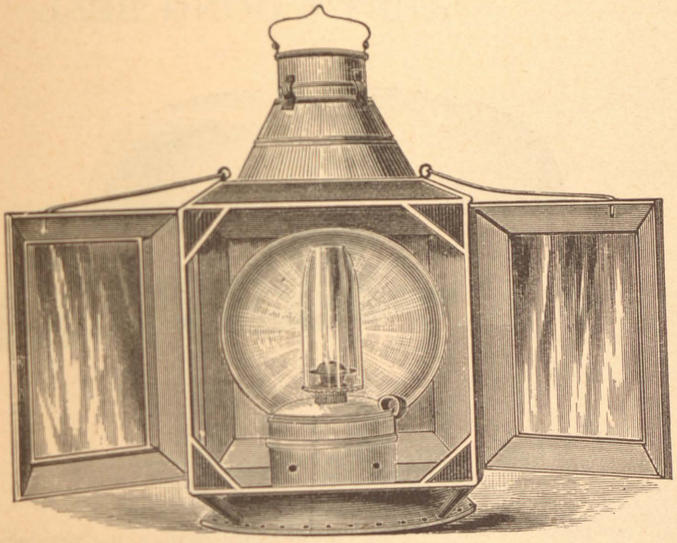
Five gallon Cans, extra, ... 75

Ten " " " 1 00

No charge for Barrels or Half Barrels.

LANTERNS.

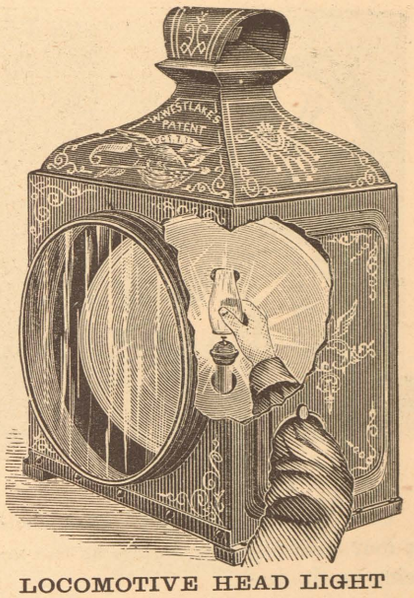
Fig. 108.



COMMON SENSE MILL LANTERN.

The Common Sense Mill Lantern is our own manufacture, and we recomend it as being the best Lantern for the price we know of, and wherever used it has given unqualified satisfaction. We use No. 3 Burner, 10-inch Reflector, and 12x14 Mirrors in Side Wings. The Lamp is protected by lights of glass on three sides. Price, $6.00.

Fig. 109.

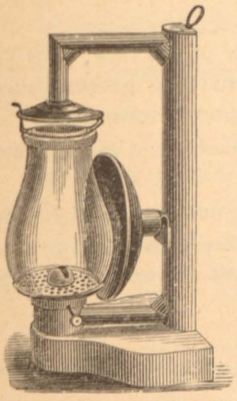


LOCOMOTIVE HEAD LIGHT FOR MILLS.

Prices, $35.00 to $75.00.

Send for Descriptions.

Fig. 110.



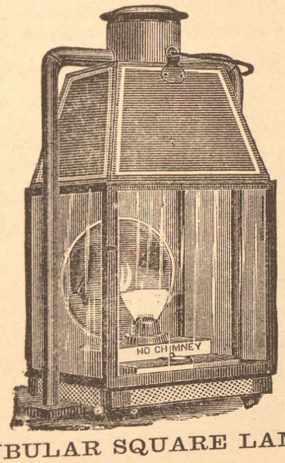
TUBULAR SIDE LAMP FOR CAMPS AND MILLS.

No. 15 has No. 1 Burner, ⅝ inch Wick, and 5-inch Silvered Glass Reflector and No. 0 Tubular Globe. Price, $1.50.

No. 17 has No. 2 Burner, 1-inch Wick, and 6-inch Silvered Glass Reflector and No. 1 Tubular Globe. Price, $1.75.

These Lamps operate on the principle of the Tubular Lantern, are not affected by currents of air; never heat and hence are perfectly safe. The Globe is free from smoke and the Lamp is filled, lighted and regulated from the outside.

Fig. 111.



TUBULAR SQUARE LAMP.

No. 2 has No. 2 Burner, 1-inch Wick and 7-inch Silvered Glass Reflector. Height of Lamp, 22 inches. Price, $4.50.

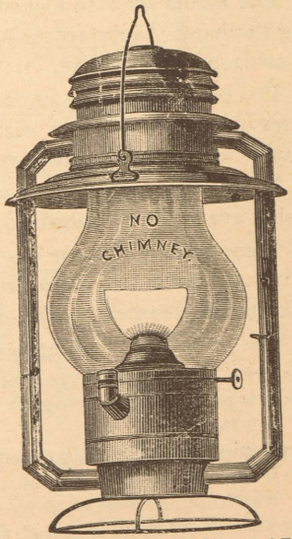
No. 3 has No. 3 Burner, 1½-inch Wick and 12-inch Silvered Glass Reflector. Height of Lamp, 27 inches. Price, $10.

The above Lamps are all made now with the improved Slip Burners.

These Lamps can be furnished with Guards if desired.

They are especially adapted for use in mills, shops, railway stations, barns, packing houses, and all places where a safe and reliable light is required. As "croquet" lamps they are unsurpassed. They are extensively used in the mines, and also as signal lights.

Fig. 112.



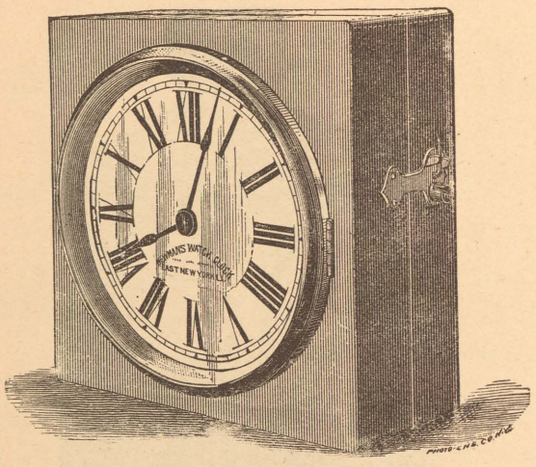
HANGING TUBULAR LAMP.

No. 3 Slip Burner, 1½-inch Wick.

The construction of this Lamp is precisely the same as that of our Globe Tubular Street Lamp, with exception of being provided with a bale. It is especially adapted for lighting churches, public halls, entrances, verandas, croquet grounds, railway stations, packing houses, warehouses, factories, livery stables and mines. Price. $6.00.

WATCHMAN'S CLOCK.

Fig. 113.



Size of Clock, 10x10.

This Clock is a first-class timepiece, running full two days. The revolving paper dial makes one revolution in twenty-four hours, or half as fast as the hour hand, which is on the front or face of the clock, the removable paper dial being on the back.

This indicator is absolutely tamper-proof, the works and dial being locked by a very simple catch which requires no fancy or complicated keys to unlock, but registers the time A. M. or P. M. when it is either locked or unlocked.

The watchman using a duplicate key and dial will not prevent your immediate detection of fraud. The tampering with watch clocks by watchmen is a common thing.

The hands are also locked and turned from within, this preventing employees generally from meddling with or turning the hands backward or forward, which is often done on ordinary timepieces, but is very objectionable. These clocks are good timekeepers.

The puncturing arrangement on the new clock, is a lever projecting on the outside of the case, which if turned a quarter of an inch or more, will throw a small steel needle in a blank part of the dial, making a round hole, plainly discernable so that by a glance you can tell the exact time of day or night when the punctures were made.

Marine movements are used, which run in any position like a watch, jarring of machinery will not stop them. A number are used on steamboats and ships.

A good many of these clocks are in use in places where men have certain duties to perform at night, and whose duties it is desirable to control, such as feeding horses in stables, charging furnaces or vessels, and taking samples for examination in chemical works, distilleries, breweries and oil refineries; they are also used for many other purposes.

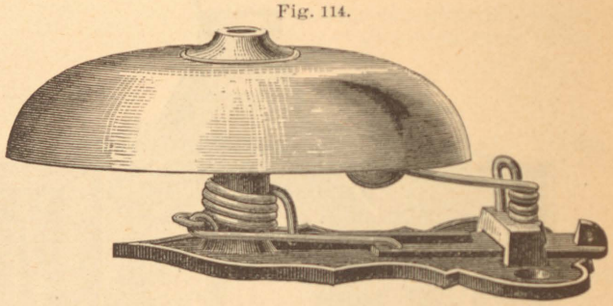
The principal advantages over other indicators are:

1. The great simplicity of its arrangements and the simple way that it is worked.
2. The low price, which brings it in reach of everybody employing men at night, being the cheapest thing of the kind in the market.
3. It is a good timepiece, and therefore answers a double purpose.
4. The large and easily read dial, showing both day and night in different half circles, answering for Sunday or day watchmen as well as those on duty at night.
5. It is absolutely tamper-proof, thereby preventing fraud.
6. It shows the exact time that it is punctured instead of compelling a man's appearance within a certain limited time.
7. It is the only indicator suitable for places where outside watchmen are employed, such as stores, dwellings, banks, etc. For that purpose a small attachment with wire is furnished on application.

The clock can be hung in any part of the house and operated from the outside. Price, $10.00 net.

ABBY'S GONG BELL.

Fig. 114.



GONG BELLS.

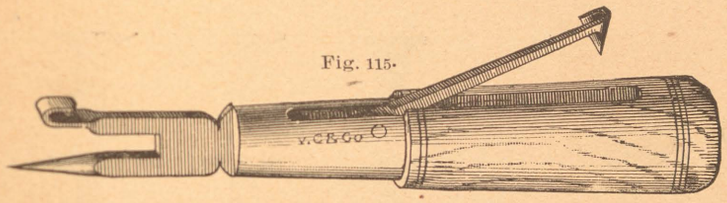
Diameter, inches,	3	4	5	6	7	8	10	12
List Price, per dozen, Polished Bell Metal,	$8.00	$10.00	$14.00	$20.00	$28.00	$40.00	$64.00	$120.00

EXTRA LARGE POLISHED BELL METAL.

Diameter, inches,	14	16	18
List Price, per dozen,	$192.00	$264.00	$360.00

TIMBER SCRIBE.

Fig. 115.

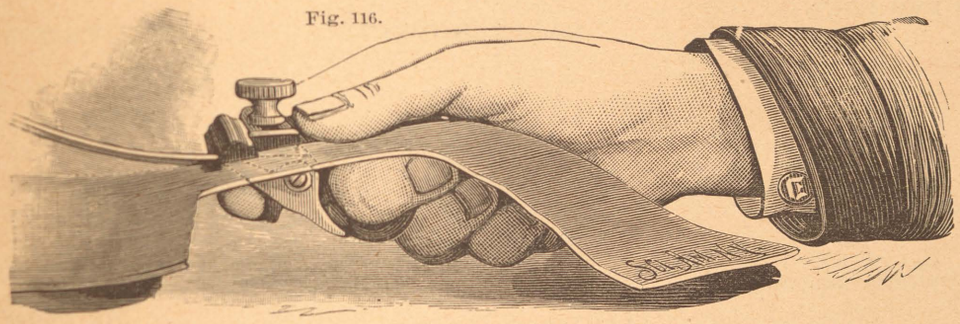


The Timber Scribe is used for marking ends of Logs or Timber. Also can be used for marking gauge on Barrels.

Price, each.....

ELLIOTT'S NEW LACE CUTTER.

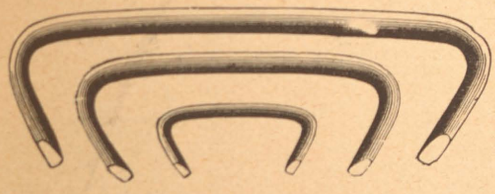
Fig. 116.



Price, each,..... .....75 cents.

BELT FASTENERS.

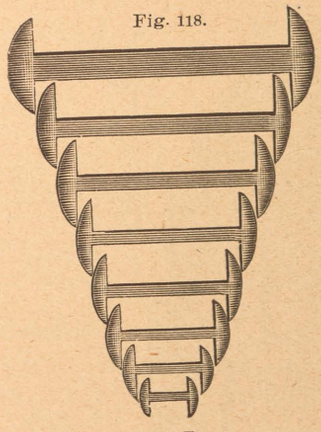
Fig. 117.



POINTED BELT HOOKS.

No. 15, per M.,	$2 00		No. 7, per M.,	$ 6 00	
No. 14, "	2 40		No. 6, "	8 50	
No. 13, "	2 60		No. 5, "	11 00	
No. 12, "	2 80		No. 4, "	14 00	
No. 11, "	3 00		No. 3, "	16 00	
No. 10, "	3 50		No. 2, "	20 00	
No. 9, "	4 00		No. 1, "	30 00	
No. 8, "	5 00				

Fig. 118.

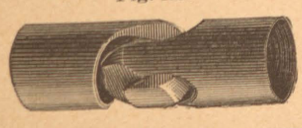


100 in a Box.

BLAKE'S BELT STUDS.

No. 6, per box,	$ 60		No. 2, per box,	$1 25	
No. 5, "	70		No. 1, "	1 65	
No. 4, "	80		No. 0, "	2 00	
No. 3, "	90		No. 00, "	2 50	
Large Cutters for Rubber Belts,				1 25	
Small Cutters for Leather Belts,				90	
Awls to spread the Slit,				25	

Fig. 119.



ROUND STEEL BELT COUPLING.

PRICES OF ROUND STEEL BELT COUPLINGS.

$\frac{1}{8}$ inch, per doz.,	$2 00	$\frac{5}{16}$ inch, per doz.,	$2 50	$\frac{1}{2}$ inch, per doz.,	$4 00	$\frac{3}{4}$ inch, per doz	$ 9 00		
$\frac{3}{16}$ " "	2 00	$\frac{3}{8}$ " "	3 00	$\frac{9}{16}$ " "	5 00	$\frac{7}{8}$ " "	13 00		
$\frac{1}{4}$ " "	2 00	$\frac{7}{16}$ " "	3 50	$\frac{5}{8}$ " "	6 00	1 " "	18 00		

COPPER RIVETS AND BURS.

Fig. 122.

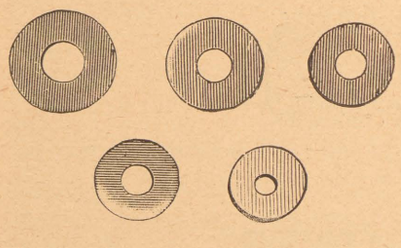
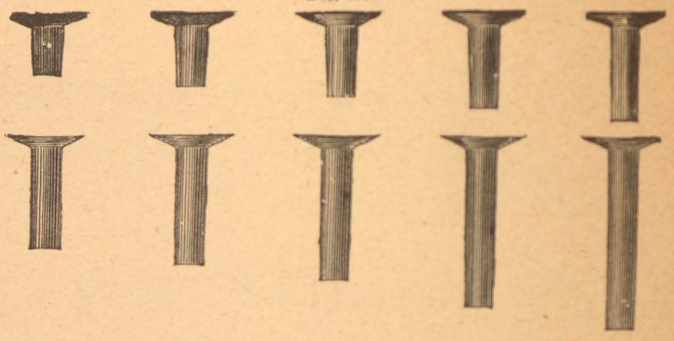


Fig 123.



PRICE PER POUND.

	List.
No. 5, Belt Rivets	$ 0 49
" 6, "	49
" 7, "	49
" 8, "	50
" 9, "	52
" 10, "	54
" 11, "	56
" 12, "	58
" 13, "	60
" 14, "	65
" 15, "	70

Burs, above Numbers, same prices.

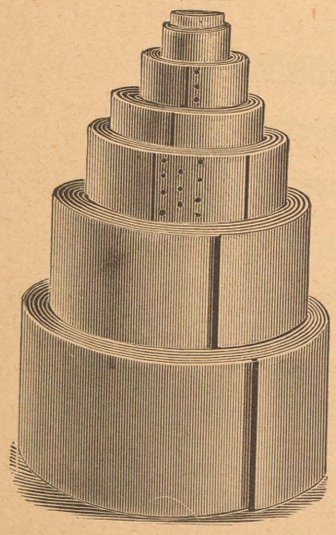
TABLE SHOWING NUMBER OF RIVETS AND BURS TO THE POUND.

No.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2	Burs.
7	272	250	228	180	164	160	148	112	116	100	84	80	69	345
8	276	248	208	200	178	172	152	136	110	104	96	.....	.....	390
9	340	280	272	248	228	220	184	176	156	136	.....	.....	.....	610
10	544	448	384	340	304	300	272	238	204	.....	.....	.....	.....	716
12	588	512	452	404	364	334	304	272	.....	.....	.....	.....	.....	985
13	996	852	532	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1630

LEATHER BELTING, BEST OAK TANNED.

STRICTLY SHORT LAP.

Fig. 124.



PRICE LIST.

1 inch	$ 0 09	4½ inch	$ 0 51	18 inch	$ 2 26
1¼ "	12	5 "	57	20 "	2 58
1½ "	15	5½ "	63	22 "	2 90
1¾ "	18	6 "	69	24 "	3 22
2 "	21	7 "	81	26 "	3 56
2¼ "	24	8 "	93	28 "	3 90
2½ "	27	9 "	1 05	30 "	4 22
2¾ "	30	10 "	1 17	32 "	4 54
3 "	33	11 "	1 29	34 "	4 86
3¼ "	36	12 "	1 41	36 "	5 18
3½ "	39	13 "	1 53	40 "	5 82
3¾ "	42	14 "	1 65	44 "	6 46
4 "	45	15 "	1 80	48 "	7 10
		16 "	1 94		

Double Belts, Double Price.

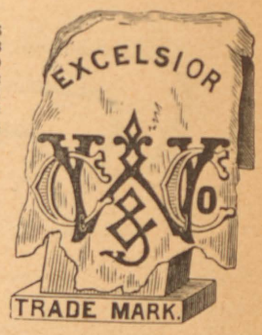
RAW HIDE BELTING.

We keep in stock small sizes for Quick Motion Machinery. List, same as above.

Round Belt, Twisted.

1-8 inch	5 cents.	1-2 inch	25 cents.
3-16 "	9 "	5-8 "	30 "
1-4 "	12 "	3-4 "	38 "
5-16 "	16 "	7-8 "	45 "
3-8 "	20 "	1 "	53 "

Fig. 125.



We are Agents for Wm. Coupe & Co.'s Celebrated Raw Hide Lace Leather.

LACE LEATHER.

Buckskin Lacing, per pound .....
Raw Hide, per square foot .....
Best Calcutta assorted Sides, per pound .....

CUT LACINGS.

¼ inch per 100 feet	$ 1 00	⅝ inch per 100 feet	$ 2 75
⅜ " " "	1 50	¾ " " "	3 25
½ " " "	2 00		

RUBBER BELTING.

THREE PLY.

2 inches	17 cents.	7 inches	$ 0 60	15 inches	$ 1 38
2½ "	22 "	8 "	70	16 "	1 50
3 "	26 "	9 "	80	18 "	1 70
3½ "	30 "	10 "	90	20 "	1 90
4 "	34 "	11 "	1 00	22 "	2 12
4½ "	39 "	12 "	1 08	24 "	2 36
5 "	43 "	13 "	1 18	26 "	2 60
6 "	52 "	14 "	1 28	28 "	2 84

FOUR PLY.

2 inches	$ 0 21	11 inches	$ 1 18	30 inches	$ 3 64
2½ "	26	12 "	1 30	32 "	3 92
3 "	31	13 "	1 42	34 "	4 20
3½ "	37	14 "	1 54	36 "	4 48
4 "	42	15 "	1 66	38 "	4 76
4½ "	47	16 "	1 78	40 "	5 04
5 "	52	18 "	2 02	42 "	5 32
6 "	62	20 "	2 26	44 "	5 60
7 "	73	22 "	2 52	46 "	5 88
8 "	84	24 "	2 80	48 "	6 16
9 "	95	26 "	3 08		
10 "	1 07	28 "	3 36		

☞ Intermediate widths at proportionate rates. ☜

Heavy 5 and 6 ply Belts furnished to order, at an advance of 25 and 50 per cent. respectively on 4 ply prices.

AGRICULTURAL MACHINE BELTING.

1 inch, 2 ply	$ 0 07	2½ inch, 2 ply	$ 0 18
1¼ "	09	3 "	22
1½ "	11	3½ "	26
2 "	15	4 "	30

We keep on hand the following sizes:

2 ply. 1, 1½, 2, 2½, 3, 3½ and 4 inch.

3 ply. 2, 2½, 3, 3½, 4, 4½, 5, 6 and 7 inch.

4 ply. 6, 7, 8, 9, 10, 12 and 14, inch.

We can furnish any other sizes on short notice.

Full rolls of Belting, as manufactured for the trade, measure from 300 to 350 feet long, but we cut Belts to order of any length required.

For Belts less than 6 inches wide, the 3-ply is sufficiently strong, unless the work is unusually heavy for the width. Belts wider than 6 inches should not be less than 4 ply, unless the work is unusually light for the width.

ENDLESS RUBBER BELTS.

Endless Belts of any width or length furnished to order at current list prices, with an additional charge for the joining, equal to the price of three feet of the belt, and 10 per cent additional on the net price of the whole belt.

MILL ELEVATOR BELTING.

Or Three Ply Heavy Cotton Belting, in any Length Desired.

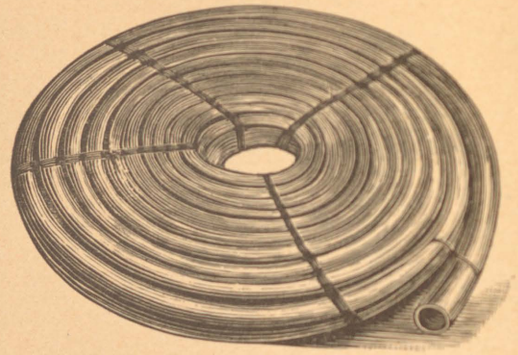
NET PRICE LIST.

1½ inch	$ 0 07	7 inch	$ 0 28
2 "	09	8 "	32
2½ "	11	9 "	36
3 "	13	10 "	40
3½ "	15	12 "	50
4 "	16	14 "	62
4½ "	18	16 "	75
5 "	20	18 "	86
6 "	24	20 "	96

Or any width desired furnished to order. Cut in any length ordered.

RUBBER HOSE.

Fig. 126.



CONDUCTING HOSE.—TWO PLY.

This is the thinnest Hose made, and is designed to conduct water under a moderate head or pressure only. The larger sizes are mainly used for Tank Hose at Railway Stations.

Internal Diameter.	*Per Foot.*
½ inch	$ 20
¾ "	25
1 "	33
1¼ "	42
1½ "	50
1¾ inch	$ 58
2 "	66
2¼ "	75
2½ "	83
2¾ "	92
3 inch	$1 00
4 "	1 32
5 "	1 65
6 "	1 98

HYDRANT HOSE.—THREE PLY.

This Hose is of medium strength, suitable for Hydrants, Force Pumps, Garden Engines, Street Sprinkling, Washing Decks, etc., where the pressure does not exceed 75 pounds per square inch.

Internal Diameter.	*Per Foot.*
½ inch	$ 25
¾ "	30
1 "	40
1¼ "	50
1½ "	60
1¾ inch	$ 70
2 "	80
2¼ "	90
2½ "	1 00
2¾ inch	$1 10
3 "	1 20
3½ "	1 40
4 "	1 60

ENGINE HOSE.—FOUR PLY.

This Hose is designed to sustain a pressure of from 100 to 150 pounds per square inch, and is recommended—particularly the larger sizes—for all general purposes where a good, strong, reliable Hose is required.

Internal Diameter.	*Per Foot.*
½ inch	$ 30
¾ "	37
1 "	50
1¼ "	62
1½ inch	$ 75
1¾ "	87
2 "	1 00
2¼ "	1 12
2½ inch	$1 25
2¾ "	1 37
3 "	1 50
4 "	2 00

TANK HOSE.

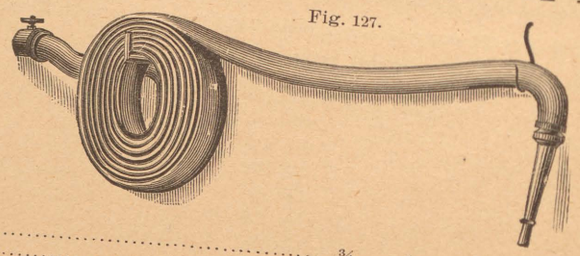
Internal Diameter.	*Per Foot.*
5 inch	$1 65
6 "	1 98
7 inch	$2 31
8 "	2 64
9 inch	$2 97
10 "	3 33

All the above kinds of Hose are kept in lengths of 50 feet.
We also can furnish to order either five or six ply Hose at an advance on four ply prices of 25 per cent. for each additional ply.

LINEN SAFETY HOSE.—CRESCENT BRAND.

FOR MILLS, SHOPS, HOTELS, AND STORES.

Fig. 127.



Can furnish in one piece any length desired, from 50 feet upwards.

Internal Diameter, inches	¾	1	1¼	1½	1¾	2	2¼	2½	3
Price	20c.	22c.	26c.	29c.	32c.	35c.	39c.	42c.	52c.

PURE RUBBER CEMENT.

Gills..... Half Pints..... Pints..... Quarts.....

STEAM, PETROLEUM, TANNERS' AND BREWERS' HOSE.

THREE PLY.—Internal Diameter.

½ inch, per foot	$ 0 43	1¼ inch, per foot	$ 0 85	2 inch, per foot	$1 34
¾ " "	51	1½ " "	1 02	2½ " "	1 66
1 " "	67	1¾ " "	1 18	3 " "	2 00

FOUR PLY.—Internal Diameter.

½ inch, per foot	$ 0 51	1¼ inch, per foot	$ 1 04	2 inch, per foot	$1 66
¾ " "	67	1½ " "	1 25	2½ " "	2 08
1 " "	83	1¾ " "	1 45	3 " "	2 80

FIVE PLY.—Internal Diameter.

½ inch, per foot	$ 0 64	1¼ inch, per foot	1 30	2 inch, per foot	$2 08
¾ " "	84	1½ " "	1 56	2½ " "	2 60
1 " "	1 04	1¾ " "	1 81	3 " "	3 50

SIX PLY.—Internal Diameter.

½ inch, per foot	$ 1 01	1¼ inch per foot	$ 1 56	2 inch per foot	2 50
¾ " "	2 01	1½ " "	1 88	2½ " "	3 12
1 " "	1 25	1¾ " "	2 18	3 " "	4 20

SUCTION HOSE.

ON SPIRAL BRASS WIRE.—Internal Diameter.

¾ inch, per foot	$ 0 77	1¼ inch, per foot	$ 1 25	1¾ inch, per foot	$2 10
1 " "	1 00	1½ " "	1 65	2 " "	2 50

The above are the only sizes of Suction Hose that we keep on hand, and these we supply in any lengths required, not exceeding fifty feet.

Suction Hose larger than two inches diameter furnished to order, at about one week's notice, of any size and length required.

The larger sizes, up to 12 inches diameter, are made on flat, galvanized iron wound spirally, by which method we produce Hose unequalled for flexibility and service.

RUBBER LINED COTTON HOSE.

MANUFACTURERS'

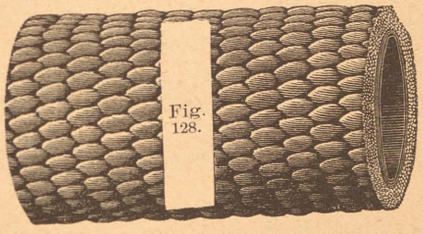


Fig. 128.

AGENTS.

Internal Diameter.

½ inch, per foot	$ 0 20	1¼ inch, per foot	$ 0 45	2¼ inch, per foot	$0 70
¾ " "	30	1½ " "	52	2½ " "	75
1 " "	35	2 " "	60		

½ and ¾ inch no extra charge for Couplings.

RUBBER TUBING.

In Lengths of Twelve Feet, one-eighth inch thick.—Internal Diameter.

PLAIN.

⅛ inch, per foot	$ 0 08	5-16 inch, per foot	$ 0 18	⅝ inch, per foot	$0 30
3-16 " "	12	⅜ " "	20	¾ " "	35
¼ " "	16	½ " "	25	1 " "	45

CLOTH INSERTION.

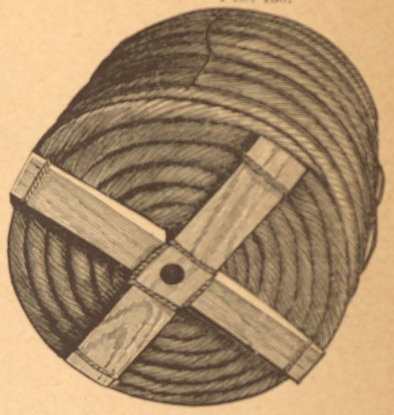
⅛ inch, per foot	$ 0 10	5-16 inch, per foot	$ 0 20	⅝ inch, per foot	$0 33
3-16 " "	14	⅜ " "	23	¾ " "	38
¼ " "	18	½ " "	28	1 " "	50

PACKING.

Fig. 129.

The Jenkins Packing has been in use for the last ten years and is acknowledged to be the best Packing for Cylinder Heads and Steam Joints ever made.

Fig. 130.



ITALIAN HEMP PACKING.

DIRECTIONS FOR USING JENKINS' PACKING.

Place the Packing in position, and screw the nuts up tight while cold. Let the steam on enough to warm the Packing, which softens it, then follow up the joint gradually until there is no escape of steam. In cutting bolt holes, make them a trifle small. In packing a steam chest, cut the inside hole one-eighth large all around. When a joint is to be made that you wish to break without injuring the Packing, the application of Pulverized Soapstone, Plumbago or Chalk will prevent sticking. After the Packing becomes set, it forms what might be called a metal of itself, and will last for years.

Jenkins' Sheet Packing, 80c. per lb. Gaskets, $1 per lb.

RUBBER OR GUM PACKING WITH CLOTH INSERTION.

OR CLOTH ON ONE OR BOTH SIDES.

Thickness.	1-ply, per lb.	2-ply, per lb.	3-ply, per lb.	4-ply, per lb.
$\frac{1}{64}$ inch,	70 cents	.....	.....	.....
$\frac{1}{32}$ "	65 "	.....	.....	.....
$\frac{1}{16}$ "	60 "	.....	.....	.....
$\frac{3}{32}$ "	55 "	63 cents	66 cents	.....
$\frac{1}{8}$ "	.....	58 "	61 "	.....
$\frac{3}{16}$ "	.....	55 "	58 "	61 cents
$\frac{1}{4}$ "	.....	.....	55 "	58 "
	.....	.....	.....	55 "

One ply of cloth for every $\frac{1}{16}$ inch thickness. Three cents additional per pound will be charged for each extra ply of cloth. Each cloth, whether insertion or on outside, to count as one ply. All Sheet Packing is made about one yard wide, and sold in rolls of any length required.

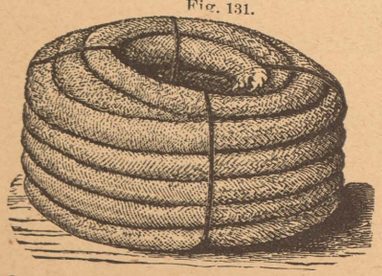
Rubber Gaskets for Manhole and Handhole Plates and Pipe Flanges furnished upon short notice.

Pure Sheet Packing or Valve Gum,	List,	per lb., $1 40
Round and Square Piston Packing,	"	" 85
Anti-Friction Packing, Round, all sizes,	Net Price,	" 75
Rubber Packing, Wire Insertion,	"	" " 50
Soapstone Packing, all sizes,	"	" " 25

HEMP PACKING.

Italian Flax,	Net Price, 40c. per lb.,	A. American Hemp,	Net Price, 20c. per lb.
" Hemp,	" " 30c. "	C. " "	" " 15c. "

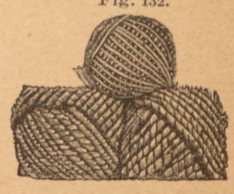
Fig. 131.



ASBESTOS PACKING.

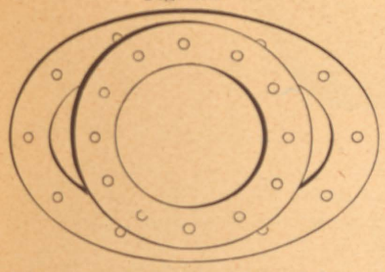
Thickness.	Price.
Round Packing, $\frac{1}{4}$ inch, per lb.,	50 cents
" " $\frac{3}{8}$ " "	50 "
" " $\frac{1}{2}$ " "	50 "
" " $\frac{5}{8}$ " "	50 "
" " $\frac{3}{4}$ " "	50 "
Sheet Packing, from $\frac{1}{32}$ to $\frac{1}{4}$ inch, per lb.,	25 "
Asbestos Wicking, per lb.,	60 "
Friction Paper, per lb.,	

Fig. 132.



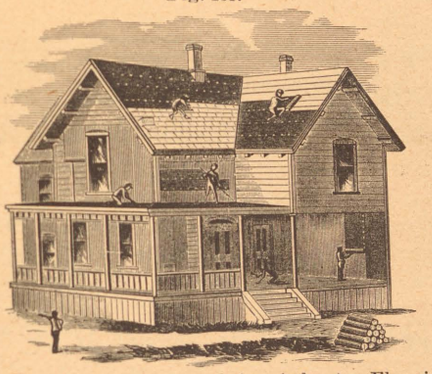
ASBESTOS FLOORING OR SHEATHING FELT.

Fig. 133.



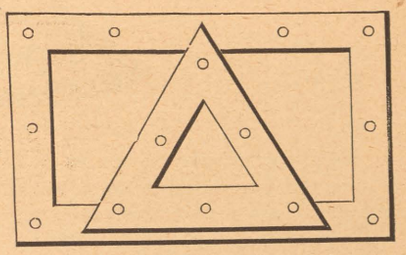
Illustrating Gaskets cut from Asbestos Mill Board.

Fig. 134.



Illustrating the method of applying Asbestos Flooring Felt.

Fig. 135.



Illustrating Gaskets cut from Asbestos Mill Board.

The use of Asbestos Flooring Felt, though intended principally for building purposes, is by no means confined thereto. For fire-proof linings of all kinds in safes, railroad passenger and freight cars, refrigerators of all kinds, and any other purposes requiring a fire or acid proof or non-radiating material, it stands without a superior, and the low price at which it can be obtained places it within the reach of all. As a deadener of sound, one thickness of Asbestos Flooring Felt is considered equal to two or three thicknesses of ordinary sheathing paper.

Asbestos Flooring Felt is furnished in rolls of about 100 pounds each, of a width of 44 inches. It comes with clean cut edges, so there is no unnecessary waste. It has a covering capacity of nine to ten square feet to the pound.

Price, per pound, 20 cents.

ASBESTOS MILL BOARD.

Manufactured from pure Asbestos of the finest quality and strongest fibre, for use in locomotive domes, steam-chest covers, man-holes, hand-holes, cylinder heads, pipe joints, flange joints, acid joints, etc.

It is manufactured in sheets 42x44 inches in size; from $\frac{1}{32}$ to $\frac{1}{2}$ inch in thickness.

The approximate weights of sheets are as follows:

Thickness per sheet,.....	$\frac{1}{32}$,	$\frac{1}{16}$,	$\frac{3}{32}$,	$\frac{1}{8}$,	$\frac{3}{16}$,	$\frac{1}{4}$,	$\frac{3}{8}$,	$\frac{1}{2}$ inch.
Weight " "	$1\frac{3}{4}$,	$3\frac{1}{2}$	$5\frac{1}{4}$	7	$10\frac{1}{2}$,	14,	21,	28 pounds.

INSTRUCTIONS FOR USING ASBESTOS STEAM ROPE PACKING.

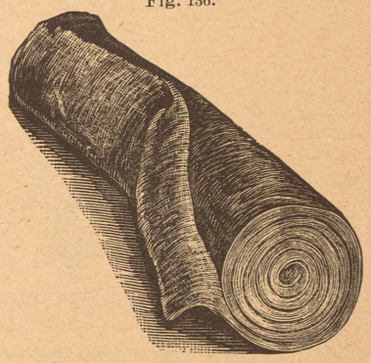
Cut the packing with a sharp knife or chisel in proper lengths for rings to meet around the piston rod, and pack so as to "break joints," filling the stuffing box as full as possible and screw up very tightly at first.

Oil or grease the packing thoroughly before using. Mineral oils are the most suited, but not absolutely necessary.

After running a day or two screw up and add another ring if practicable.

Use packing one-eighth of an inch larger than space in stuffing box.

Fig. 136.

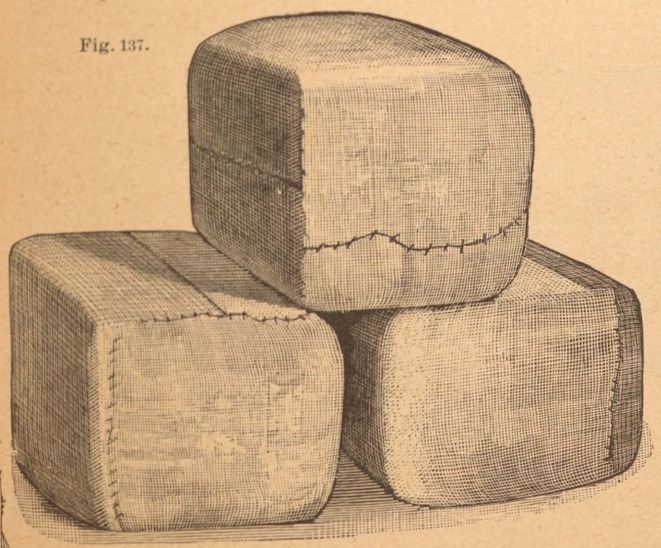


HAIR FELT.

Used with Asbestos Sheating Felt for covering Boilers and Steam Pipes.

Thickness, inch,....	$\frac{1}{2}$	$\frac{3}{4}$	1
Per square foot,....	5c.	6c.	$7\frac{1}{2}$c.

Fig. 137.



Cotton Waste, 100 lb. Bales.

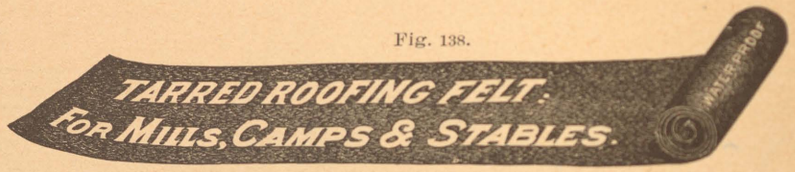
COTTON WASTE.

We always keep in stock a large supply of Waste put up in one hundred pound Bales, and can furnish all grades in larger Bales, when wanted.

Extra Cop White, per lb.,.....
Cop White, per lb., ...
No. 1 White, per lb ,.....
No. 1 Colored, per lb., ...
No. 2 " per lb., ...

TARRED ROOFING FELT.

Fig. 138.



Rolls, 2 feet eight inches wide. Price, per pound. .....

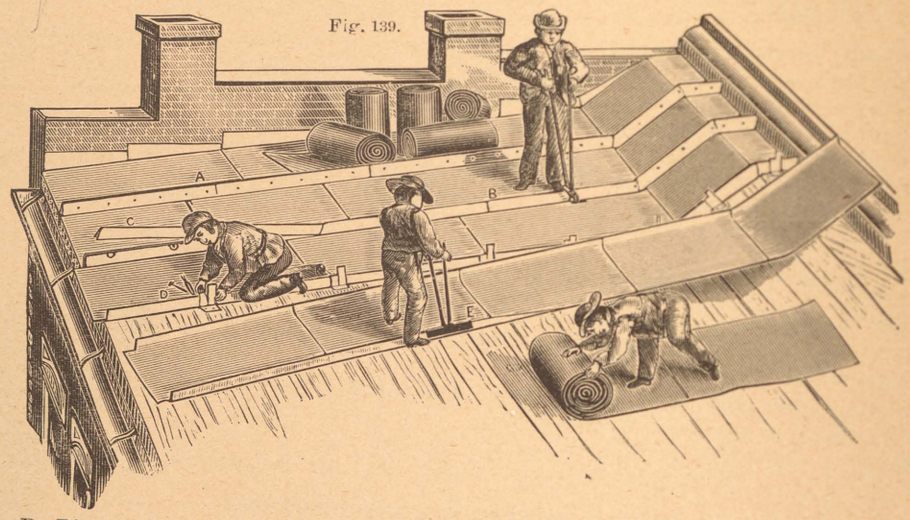
Weight per square yard—No. 1, 2 lbs.; No. 2, 1½ lbs.; No. 3, 1 to 1¼ lbs.; No. 4, ¾ lb.

For Camp and Stable Roofs No. 1 or No. 2 is best. Tarred Felt will not crack or break as does the Tarred Paper or Board, and is much more desirable. Where Cleats are not used would advise putting it on with 20 or 24 oz. Tacks.

In ordering please state weight per square yard desired, also No.

GARRY'S CAP ROOF IN PROCESS OF LAYING.

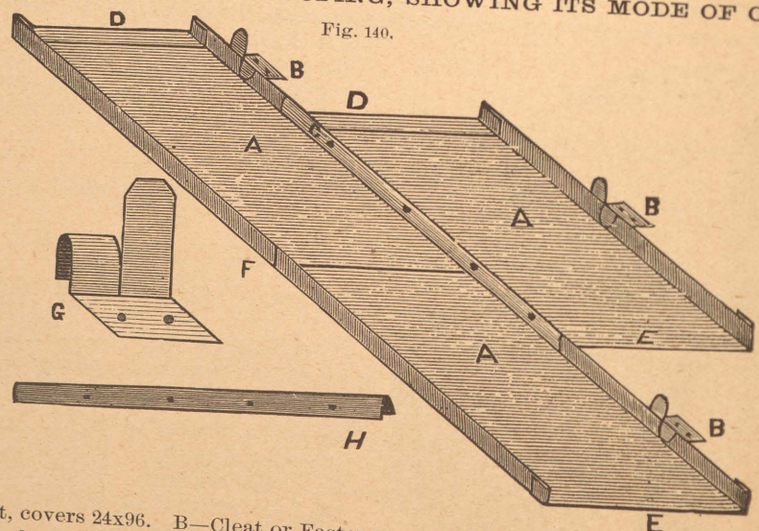
Fig. 139.



A—Seam complete. B—Riveting on the Cap. C—Showing Cap partly on. D—Putting down Cleat or Anchor. E—Forming up the side with Roofing Tongs.

PLAN OF GARRY'S PATENT CAP ROOFING, SHOWING ITS MODE OF CONSTRUCTION.

Fig. 140.

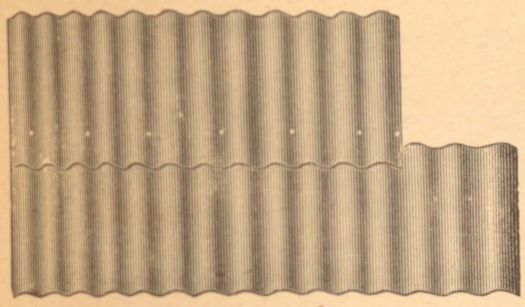


A—Full size Sheet, covers 24x96. B—Cleat or Fastener, as applied to Roof. C—Cap applied and riveted. D—Lower Lock on end of Sheet. E—Upper Lock on end of Sheet. F—Ends of Sheets locked together. G—Cleat or Fastener. H—Iron Cap.

SIDING, CEILING AND ROOFING.

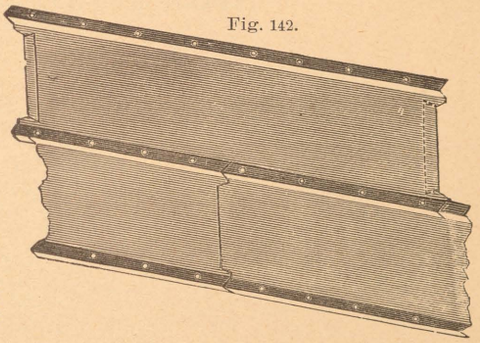
CORRUGATED IRON ROOFING, SIDING AND CEILING, AND CRIMPED EDGE ROOFING.

Fig. 141.



This Siding is designed more particularly for Grain Elevators. The corrugations are made crosswise of the sheet, so when applied they will run up and down the building, giving more elasticity to the iron, and preventing its buckling, as other iron siding does, when the building settles.

Fig. 142.



In laying we lap the sheet on to the one below, about one inch—as shown in the cut—then nail through the upper sheet about one inch above the laps, thus allowing for movement of the iron as the building settles. Send for prices

The Crimped Edge Roofing is designed for a cheap class of buildings, such as Rolling Mills, Furnaces, Cotton Sheds, Barns, Awnings, etc. It can be laid upon sheeting boards, cross strips, or rafters without sheeting boards.

The advantage of our Crimped Roofing over others of similar kind is, that we form a lock on the end of the sheet before it is shipped, which makes it much better than lapping the ends or forming the locks on the roof, which has to be done by all others. Also it can be laid without the use of the three-sided wood strip (V strip) or without forming the rafter to fit the crimp—thus saving the expense of the wood strip. But if parties prefer to use the V strip we will furnish them at the lowest market price, or will send sample piece with the roofing, and parties can get them out where the roofing is used, but we always lay this roofing without the strip. In laying the roof always nail through on the top of the crimp, and not the sides, using the 1¾ inch Wire Barb nail. Set it down close, but not so as to flatten or dent the crimp. We can furnish the nails at market rates. By dispensing with the sheeting boards, there is nothing used for roofing cheaper or more desirable, besides it is FIRE PROOF. It also can be used as siding for wooden buildings. When laid upon rafters without sheeting boards, the rafters must be laid two feet apart, from center to center, as the sheets lay two feet wide. It can be laid upon a pitch of three inches to the foot. This Roofing (like all our other kinds), is thoroughly coated on both sides with the Iron Ore Paint before being shipped. Send for our prices before ordering of other parties.

DIRECTIONS FOR LAYING GARRY'S PATENT CAP ROOFING.

If the roof is flat and sheds one way, send the exact length of roof, allowing two inches to bend over the eaves and six inches to turn up for flashing in front, thus:

6 in. 45 feet.

2 in. 45 feet 8 inches.

Or, if the roof is gable and sheds both ways, thus:

2^0 2_0 40 feet from eave to eave, allowing 2 inches on eachside to bend down over edge.

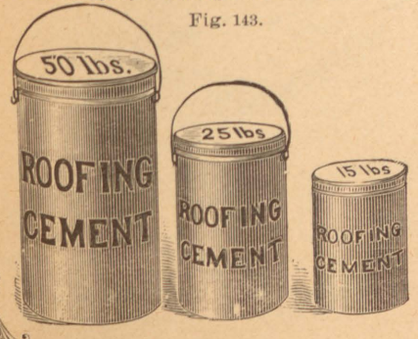
The strips are put up the full length for either style desired, or if the roof is hipped, the required amount of roofing is put up in bulk—the strips being about 50 feet long, which can be cut the right length and shaped to be used. The cross-locks are locked and grooved together, saving the labor of putting them together on the roof.

Turn up each edge of iron 1¼ or 1½ inches with our Roofing Tongs—by this process the cross seams are also turned up—place the strip in position; fasten down with cleat, putting them from 12 to 15 inches apart; after the roofing iron is all laid, take the caps which are shipped already formed, and place them over the standing seam, squeeze them up snugly with tongs, and rivet it every fifteen inches, as is shown in the cut. To fit around chimneys and sky lights, cut the iron to fit snugly, the same as in tin roofing, but use our cement instead of solder in the corners or laps of iron. We always use tin or galvanized iron for valleys and gutters. Lock the iron, double seaming it on to the valley or gutter; fill the lock with cement or thick paint before pounding it down, always have the back side of gutter higher than the eave. After the roof is all laid, give it a good coat of Iron Ore Paint.

ROOFING CEMENT.

Roofers and Builders have long felt the need of some material to take the place of solder for repairing old roofs. The successful use of our cement for ten years gives us utmost confidence in introducing it as the only Cement in the market that can be used with success in the laying or repairing Iron or Tin Roofs and Gutters. By thinning it down with boiled Linseed Oil, it makes the best paint or coating for Iron or Tin now in use. Our Cement is clear from acids, alkilies or tar sabstances, thus leaving the water perfectly pure. Its compositions are such that it remains in an elastic condition for years, at the same time hardening on the surface sufficient to walk over it without injury. Owing to its elasticity, it accommodates itself to the expansion and contraction of metal, and does not crack or peel off. Old tin roofs and gutters that were repaired some ten years ago, and seemed comparatively worthless at the time, are good to-day. It is put up in iron cans, holding fifteen, twenty-five, and fifty pounds. Directions for using are on each can.

Fig. 143.



☞Send for prices.

WEIGHTS OF ROOFING IRON.

Garry Pat. Roofing.

No. of Wire Gauge.....	20	22	24	26
Wt. per sq. ft. on roof..	$2\frac{15}{100}$	$1\frac{90}{100}$	$1\frac{50}{100}$	$1\frac{00}{100}$

Crimped Roof and Siding.

No. of Wire Gauge.....	20	22	24	26
Wt. per sq. ft. on roof..	$2\frac{15}{100}$	$1\frac{80}{100}$	$1\frac{40}{100}$	$\frac{90}{100}$

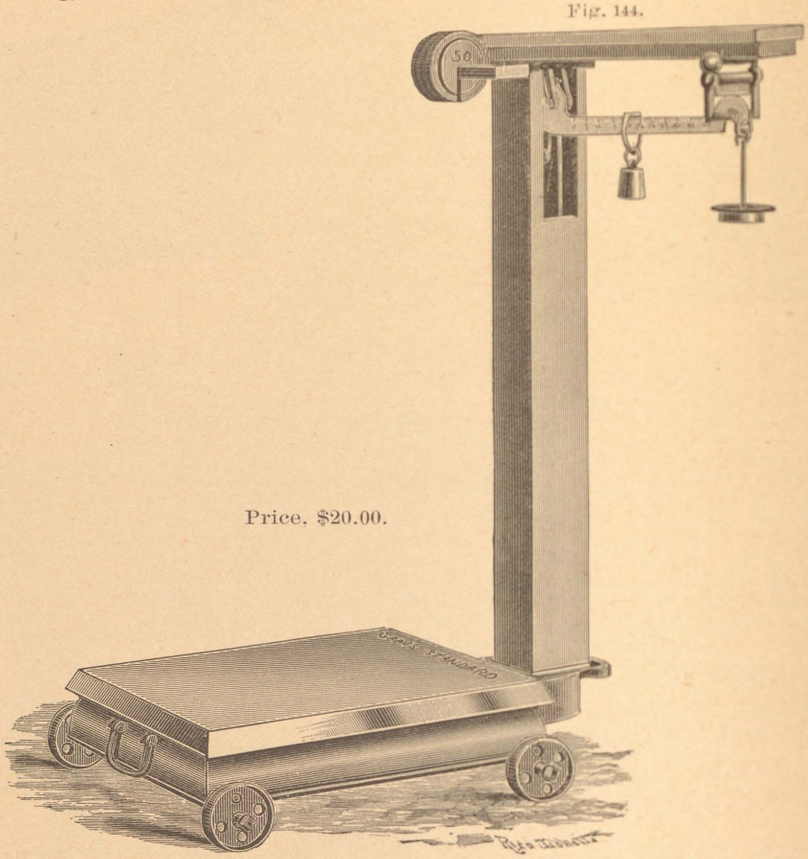
Corrugated Iron Roofing, Siding & Ceiling.

No. of Wire Gauge.....	20	22	24	26
Wt. per sq. ft. on roof..	$2\frac{15}{100}$	$1\frac{90}{100}$	$1\frac{50}{100}$	$1\frac{00}{100}$

SCALES.

GRAY'S STANDARD 600 POUNDS SCALE.

Fig. 144.

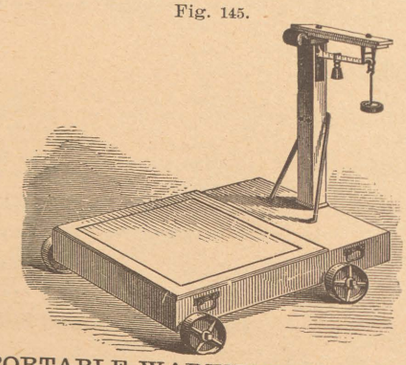


Price, $20.00.

This Scale is of generous size and very strongly made, hardened Pivots, finely finished Beam and Wood-work, Wrought Iron Axles and Wheels. An accurate, durable and reliable Scale. The Platform all Iron, with wide Flanges. An excellent Scale in any business where there is much moisture.

FAIRBANKS SCALES.

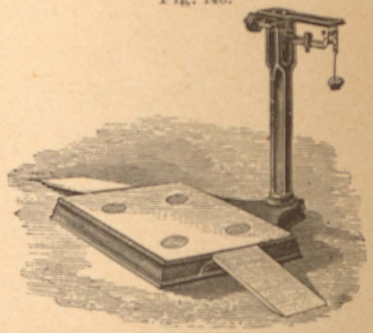
Fig. 145.



PORTABLE WAREHOUSE SCALES.

					List. With Wheels.	List. Without Wheels.
No. 1,	Capacity	5,000 lbs.,	Platform	48x48 in.,	$185.00	$170.00
No. 4,	"	3,500 "	"	42x44 "	125.00	110.00
No. 5,	"	2,500 "	"	31x40 "	105.00	95.00

Fig. 146.



WHEELBARROW SCALES.

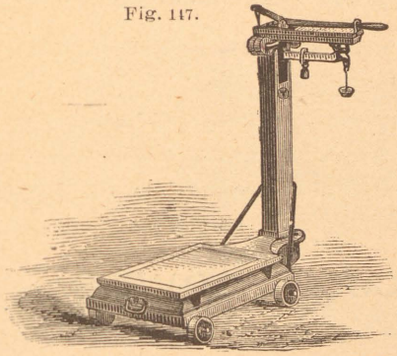
New Pattern. Extra Heavy.

	List Price.
Platform 2½x3½ feet, Capacity 1,000 lbs.,	$70.00
Same Scale, with Wheels,	75.00

This Scale is much used in the Saginaw Valley for loading Bulk Salt in Cars.

SCALES.

Fig. 147.



FAIRBANK'S PORTABLE PLATFORM SCALES.

WITHOUT WHEELS.				List.
No. 7.....	Capacity, 2,000 lbs.....	Platform, 30 x 23 in.....	Price,	$70 00
" 8.....	" 1,600 "	" 30 x 23 "	"	60 00
" 9.....	" 1,400 "	" 28 x 21 "	"	52 00
" 10.....	" 1,200 "	" 28 x 20 "	"	45 00
" 10½.....	" 900 "	" 26 x 17 "	"	39 00
" 11.....	" 600 "	" 25 x 16 "	"	30 00
" 11½.....	" 400 "	" 21 x 15 "	"	23 00

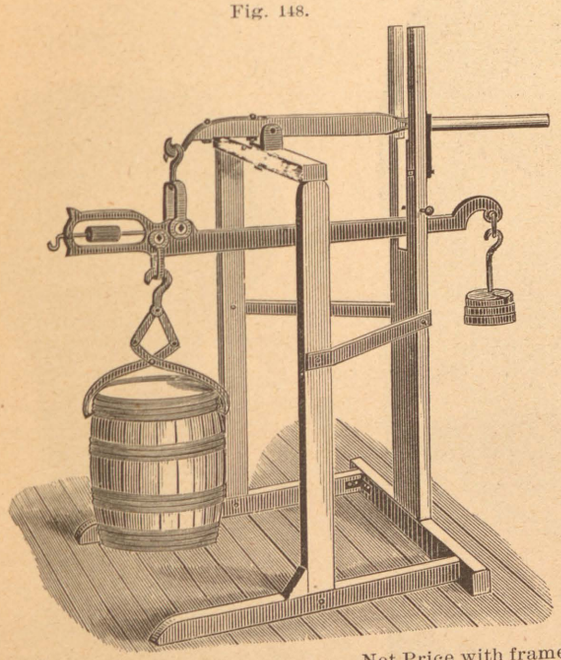
WITH WHEELS.				List.
No. 7, ...	Capacity, 2,000 lbs....	Platform 30 x 23 in....	Price,	$75 00
" 8, ...	" 1,600 "	" 30 x 23 "	"	65 00
" 9, ...	" 1,400 "	" 28 x 21 "	"	56 00
" 10, ...	" 1,200 "	" 28 x 20 "	"	49 00
" 10½....	" 900 "	" 26 x 17 "	"	43 00
" 11, ...	" 600 "	" 25 x 16 "	"	33 00
" 11½....	" 400 "	" 21 x 15 "	"	26 00

Sliding Poise without extra charge.

WITH HEAVY WHEELS AND DROP LEVER. (Fig. 147.)				List.
No. 2, ...	Capacity 3,000 lbs....	Platform, 39 x 30 in...	Price,	$125 00
" 7,	" 2,500 "	" 30 x 23 "	"	94 00
" 8,	" 2,000 "	" 30 x 23 "	"	82 00
" 9,	" 1,500 "	" 28 x 21 "	"	70 00
" 10,	" 1,200 "	" 28 x 20 "	"	59 00
" 10½,	" 1,000 "	" 26 x 17 "	"	51 00

SYRACUSE SALT SCALES.

Fig. 148.



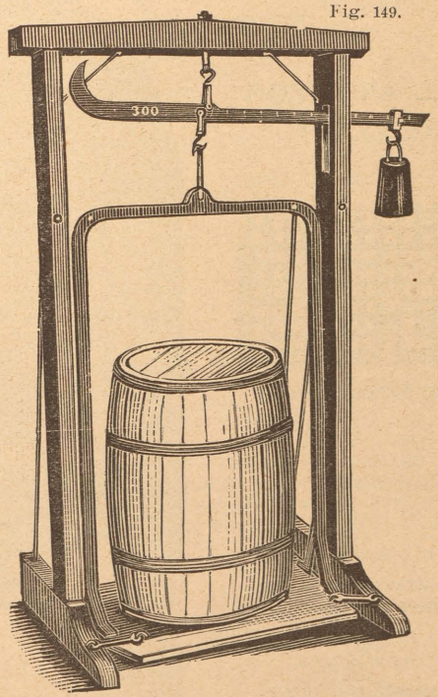
Capacity. 310 lbs.

Net Price with frame. $25 00.

This scale will be found very convenient and expeditious for the use of Salt Packers. The frame is made of ash, and it is thoroughly ironed and braced.

SAGINAW SALT SCALES.

Fig. 149.



Capacity. 300 lbs.

Net Price complete. $30 00.

The frame of this scale is made of white ash heavily ironed and braced. The scale has been thoroughly tested in the Saginaw Valley, and on account of platform is the most convenient and expeditious scale for weighing salt in barrels that we have ever seen.

SHOVELS.

Fig. 150.

SCOOP SHOVEL.

Morley Brothers' R. R. Solid Steel Coal Shovel.
Marshall's Black R. R. Solid Steel.
Marshall's Polished R. R. Solid Steel.
Myer's Polished R. R. Solid Steel Patent Ferrule.
McNaught's Black R. R. Iron Strapped.
McNaught's Polished Iron Strapped.

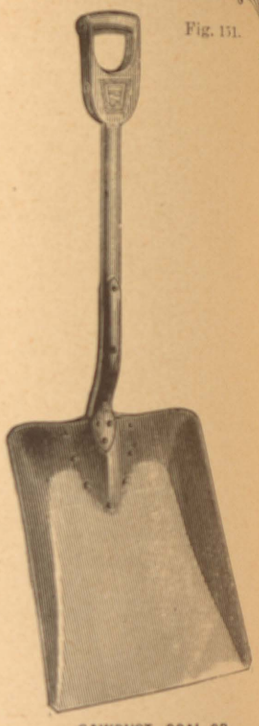
SCOOP SHOVELS.

Marshall's Polished Steel, all sizes.
Marshall's Half-Polished Steel, all sizes.
McNaught's Half-Polished Iron, all sizes.
McNaught's Polished Iron, all sizes.
Myer's Polished Steel, all sizes.

COAL SHOVELS.

Marshall's Large.

Fig. 151.

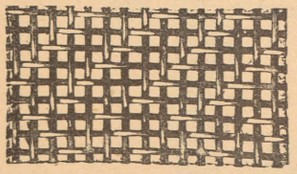


SAWDUST, COAL OR SNOW SHOVEL.

SPARK ARRESTERS.

STEEL AND IRON WIRE CLOTH.

Fig. 152.



STANDARD HARDWARE GRADE.

No. Meshes to Inch.	No. Wire.	List Price per Roll of 100 Feet.
4 x 4	21	6c. per sq. ft.
6 x 6	23	6c. " "
8 x 8	25	6c. " "
10 x 10	27	6c. " "

16, 18, 20, 24, 30 and 36 in. wide.

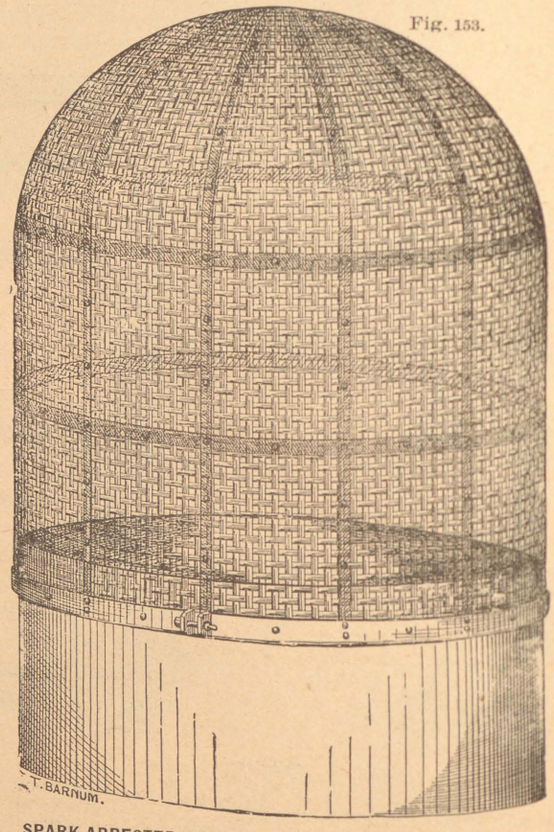
MEDIUM HEAVY GRADES FOR SMOKESTACKS.

4 x 4....No. 19....9½c. per sq. ft.
24, 30 and 36 in. wide.

HEAVY GRADES FOR SMOKE-STACKS.

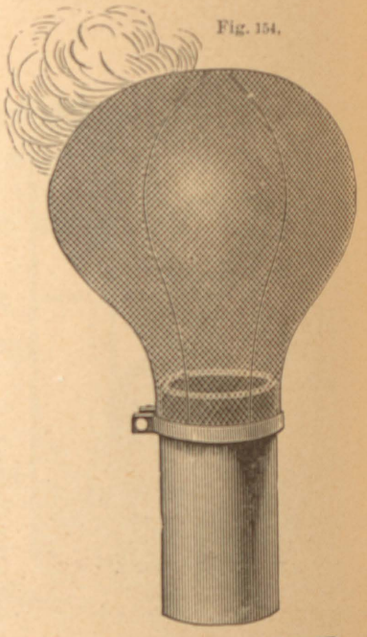
4 x 4....No. 17....12c. per sq. ft.
24, 30 and 36 in. wide.

Fig. 153.



SPARK ARRESTER FOR LARGE SMOKESTACKS AND SLAB-BURNERS.—Made to Order only.

Fig. 154.

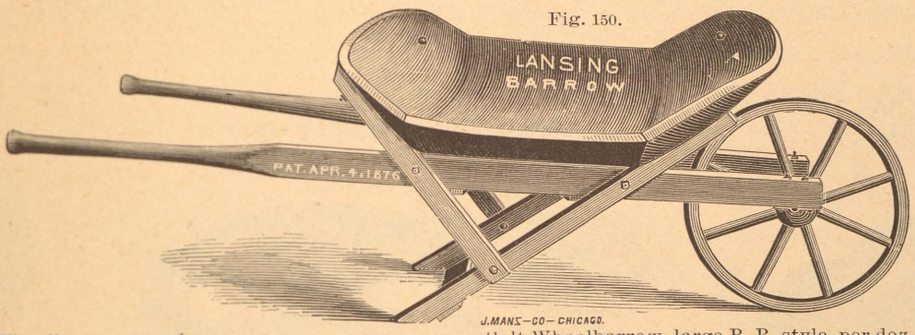


NO. 1 SPARK ARRESTER.

24 in. high, 4, 5 or 6 Mesh. List, each, $6
26 to 32 high, " " " " 8
34 to 40 high, " " " " 10

WHEELBARROWS AND SCRAPERS.

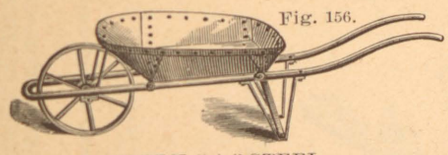
Fig. 150.



Commmon Railroad Wheelbarrow, per doz..... .....
Extra Bolted " " ....

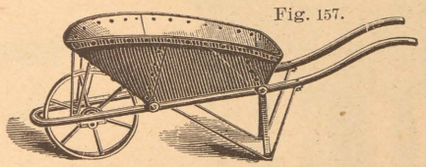
Salt Wheelbarrow, large R. R. style, per doz..... .....
Garden " with sides..... .....

Fig. 156.



PATTERN "A," STEEL.

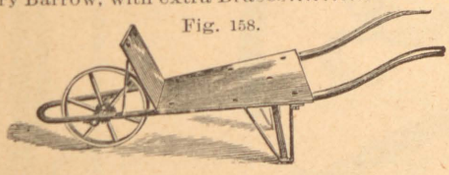
Fig. 157.



PATTERN "B," STEEL.

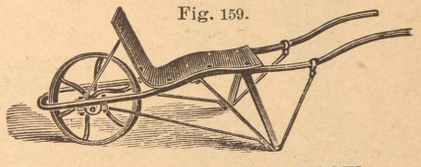
Pattern A, No. 1. Dish. Made of No. 15 Steel. Capacity, 3 cu. ft. of earth; wt. 55 pounds	$ 11 50
" " 2. " " " 14 " " " " " 60 "	12 00
" " 3. " " " 12 " " " " " 65 "	12 50
" B, No 1. Holds 200 lbs. of coal and weighs 65 lbs	14 50
" " 2. " 250 " " " 70	18 00
" " 3. " 325 " " " 80	20 00
" C. These Barrows are calculated for heavy work and rough usage. The tray, front, and front braces are pressed from a Single plate of steel; wt. 90 lbs	18 00
Steel Foundry Barrow, with extra Braces	14 00

Fig. 158.



PATTERN "C," STEEL.

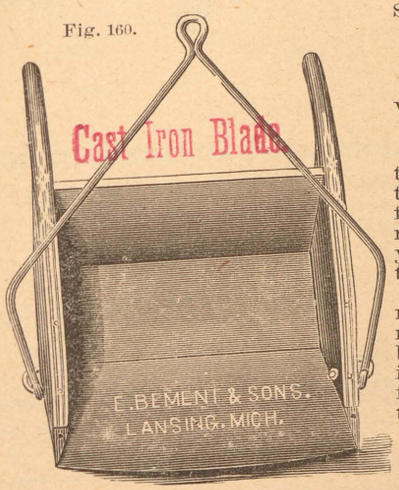
Fig. 159.



STEEL FOUNDRY BARROW.

STEEL SCRAPERS.

Fig. 160.



With Bail..... .....$ 7 50

Without Bail 6 50

DESCRIPTION.

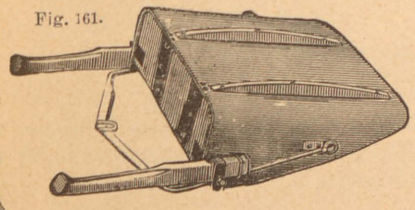
FIRST—The body is made of one blade of genuine steel, bent into such shape that it cuts and loads with perfect ease. Being thus formed, it is light, strong, and durable, having no joints, bolts, nails or screws in it, which causes so much trouble in other scrapers. These facts alone are sufficient to manifest its great superiority over all others.

SECOND—The bottom is concave-convex, and the sides are bent up so as to form curved corners, which enables it to cut through hard material, where no other Scraper can work successfully.

THIRD—The steel runners under the bottom, as shown in the cut, together with the curved corners, relieves the Scraper from all unnecessary friction; hence, it is made larger in proportion, and carries ¼ yard of dirt with the same ease to the team that an ordinary Scraper carries ⅛ of a yd.

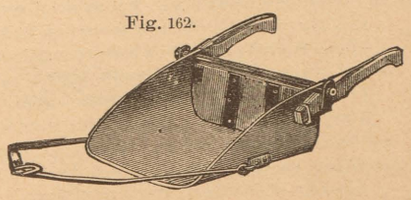
FOURTH—We call attention to the manner in which the handles are attached, by means of a tie-rod and clamp, allowing a broken handle to be replaced readily, and if the wood shrinks the handles are kept firmly by simply tightening the nuts on the tie-rod.

Fig. 161.



No. 1 (carries ¼ yd.....	$ 13 00
No. 2 (farm size).....	12 00
No. 3 (1 horse).....	11 00

Fig. 162.



DOUBLE CHAIN SCREW HOISTING MACHINE.

ONE MAN CAN LIFT 250 TO 15,000 LBS. ACCORDING TO SIZE OF MACHINE.

Fig. 163.

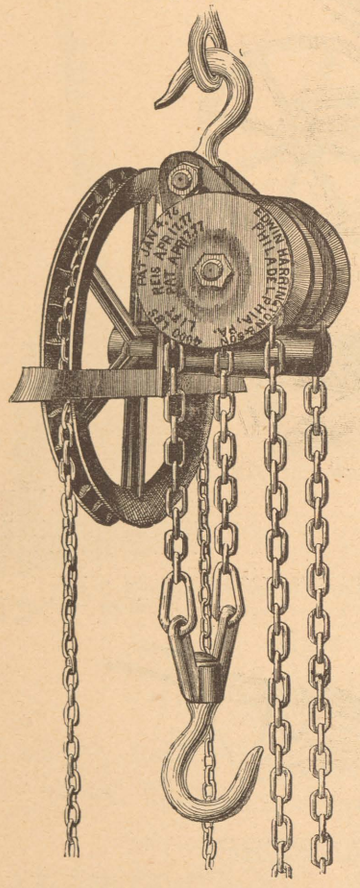
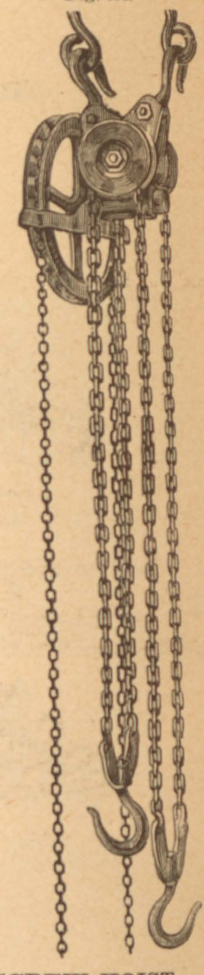
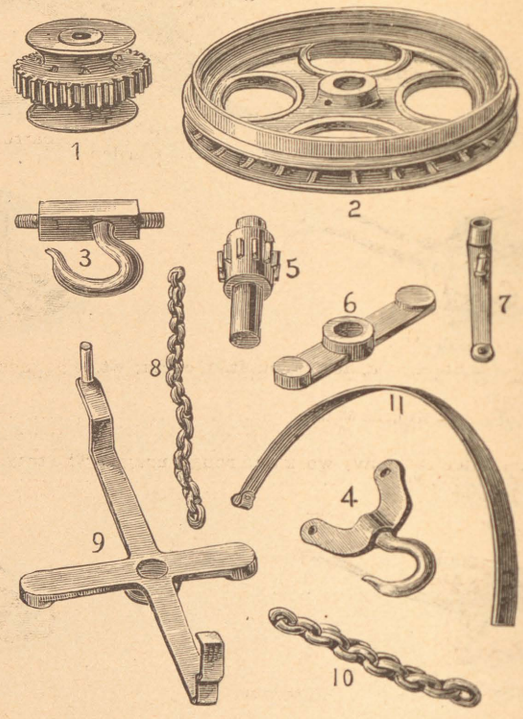


Fig. 164.



PARTS OF SCREW HOIST.

Fig. 165.



PRICES OF DOUBLE CHAIN HOISTING MACHINE AND DOUBLE HOOKS SCREW HOIST.

In ordering Chains allow four feet of Chain to each foot of Lift.

Weight of Machine.	*Lift.*	*To Raise.*	*Price.*	*Extra Lift per foot.*
35 lbs.	8 ft.	500 lbs.	$22 50	$1 00
52 "	8 "	1,000 "	25 00	1 20
65 "	8 "	2,000 "	30 00	1 50
76 "	8 "	3,000 "	40 00	1 75
140 "	9 "	4,000 "	60 00	2 00
226 "	10 "	6,000 "	75 00	2 20

Weight of Machine.	*Lift.*	*To Raise.*	*Price.*	*Extra Lift per foot.*
258 lbs.	10 ft.	8,000 lbs.	$ 95 00	$2 40
625 "	12 "	10,000 "	140 00	3 00
750 "	12 "	12,000 "	180 00	3 75
875 "	12 "	16,000 "	260 00	4 75
925 "	12 "	20,000 "	340 00	6 00

DOUBLE HOOK SCREW HOIST.—Figure 164.

To Raise	500 lbs.	1,000 lbs.	2,000 lbs.	3,000 lbs.	4,000 lbs.	6,000 lbs.
Price	$30 25	$35 75	$42 50	$53 75	$75 25	$90 25

This Hoist is same as the Double Chain, except that it is provided with two top and two bottom Hooks, leaving one Hook always down ready for a fresh load. For price of extra foot of lift see above.

Any part being broken or worn can be replaced at slight cost.

These Hoists are everywhere recognized as the standard. Adopted by the United States Government, and in use in all first-class Shops, Rolling Mills and Manufactories.

For heavy weights they have no equal.

They are safer and more durable than any other Hoists. They have independent working Chains, and the load being carried on two distinct Chains, instead of one, the possibility of accident is greatly reduced. One man can lift to the full capacity of each machine. On the smaller sizes 35 lbs. lifts 1,000 lbs., and more on the larger ones.

See List of Prices of Parts next page.

PARTS OF SCREW HOISTS.—TO ORDER.

No. 1.—Hand Chain Wheel.—Give outside diameter, size of hole for shaft, with or without set-screw.
No. 2.—Worm Gear Wheel.—Give number of cogs, width of rim, diameter of hub.
No. 3.—Lift Chain Wheels.—Give number of cogs, length and diameter of hole for shaft, and capacity of machine as lettering on outside.
No. 4.—Lift Chain.—Give number of *running* feet wanted—which is double the distance load is to be raised.
No. 5.—Hand Chain.—Same as No. 4.
No. 6.—Case.—Bottom of } Give diameter of journal
No. 7.— " Top of } bearings.
No. 8.—Worm.—Give length and outside diameter.
No. 9.—Hand Chain Guard.—Give diameter of No. 1—diameter and length of bearing for shaft.
No. 10.—Bottom Hook and Swivel.—State for what size hoist.
No. 11.—Side Plates—(Right and left). Give diameter of hole. Extreme length of casting.
No. 12.—Top Hook and Swivel.—For what size hoist.

☞In all instances tell for what size machine.☜

PRICES OF PARTS.--Page 54, Fig. 165.

Capacity	1	2	3 Two	4 Per ft.	5 Per ft.	6–7	8	9	10	11 Two.	12
500	$ 1 27	$ 1 79	$ 2 12	$ 0 35	$ 0 19	$ 1 80	$ 1 50	$ 1 12	$ 1 75	$ 0 35	$ 1 75
1000	1 47	2 01	2 32	35	25	2 00	1 66	1 32	1 94	52	1 95
2000	1 65	2 67	2 50	40	25	2 50	1 83	2 00	2 12	1 00	2 13
3000	2 75	3 50	3 00	46	25	3 00	3 00	2 67	2 37	1 66	2 38
4000	4 46	4 65	4 15	50	30	4 15	4 14	2 75	3 52	2 81	3 53
6000	4 96	4 85	4 90	55	30	5 15	4 64	3 00	4 52	3 81	4 53
8000	6 29	6 25	6 23	65	35	6 48	5 97	4 00	5 85	5 14	5 86
10000	9 29	8 56	9 23	75	45	9 48	9 00	5 06	8 85	6 15	8 86
12000	12 00	11 22	11 89	90	45	12 14	11 63	7 00	11 51	10 80	11 52
16000	.....	.....	.....	1 10	45	.....	.....	.....	.....	.....	.....
20000	.....	.....	.....	1 20	45	.....	.....	.....	.....	.....	.....

CHAINS.

CABLE AND COIL CHAINS.—Admiralty Test.

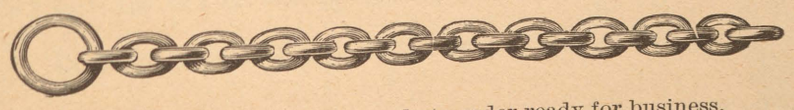
SHORT LINK CHAIN. SIZE. In.	Average wt. per fathom. Lbs.	P'RF. Tons.	PRICE Per lb.	P'RF. Tons.	Carr's Crane Chain. PRICE Per lb.
$\frac{3}{16}$	2½	¼	.....		2c. per lb. extra.
¼	4	½	.....		"
$\frac{5}{16}$	6	1	.....		"
⅜	9	2	.....	3	"
$\frac{7}{16}$	12	2½	.....	4	"
½	15	3½	.....	4½	"
$\frac{9}{16}$	19	4½	.....	5½	"
⅝	25	5½	.....	7	"
$\frac{11}{16}$	30	7	.....	8½	"
¾	35	8	.....	10	"
$\frac{13}{16}$	40	9½	.....	11½	"

SHORT LINK CHAIN. SIZE. In.	Average wt. per fathom. Lbs.	P'RF. Tons.	PRICE Per lb.	P'RF. Tons.	Carr's Crane Chain. PRICE Per lb.
⅞	47	11	.....	13	2c. per lb. extra.
$\frac{15}{16}$	54	12½	.....	14½	"
1	61	14	.....	16	"
$1\frac{1}{16}$	69	16	.....	19	"
$1\frac{1}{8}$	76	18	.....	21	"
$1\frac{3}{16}$	85	20	.....	23	"
$1\frac{1}{4}$	95	22	.....	25	"
$1\frac{5}{16}$	103	24	.....	27	"
$1\frac{3}{8}$	113	26	.....	29	"
$1\frac{7}{16}$	123	28	.....	31	"
$1\frac{1}{2}$	133	30	.....	33	"

☞All Chains are tested up to the English Admiralty Test.☜

RAFTING CHAINS.

Fig. 166.

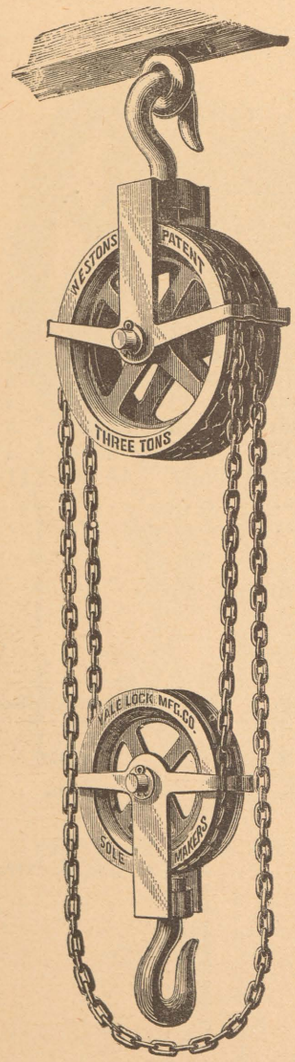


Rafting and Booming Chains of any size or pattern made to order ready for business.
Can furnish with Ring on one end and plain or with T on other end.

WESTON'S DIFFERENTIAL PULLEY BLOCKS.

DIRECT AND GEARED.

Fig. 167.



DIRECT

One man can lift 1,000 pounds.

PRICE LIST OF DIRECT BLOCKS.

CAPACITY.	PRICE. Complete with reg'lar l'gth Chains BOXED.	CHAIN. Regular Length.	CHAIN. Extra Chain Per Foot.	HOIST. See Note.*	NET WEIGHT. Complete.
$\frac{1}{8}$ Ton.	$ 15	18 ft.	36 cts.	5 ft.	11 lbs.
$\frac{1}{4}$ "	20	22 "	38 "	6 "	22 "
$\frac{1}{2}$ "	25	26 "	40 "	7 "	30 "
1 "	30	30 "	44 "	8 "	51 "
$1\frac{1}{2}$ "	40	33 "	48 "	$8\frac{1}{2}$ "	81 "
2 "	50	36 "	52 "	9 "	122 "
3 "	70	38 "	60 "	$9\frac{1}{2}$ "	173 "

EXTRA LENGTH OF CHAINS.—Allow about four feet of Chain for each foot of extra hoist.

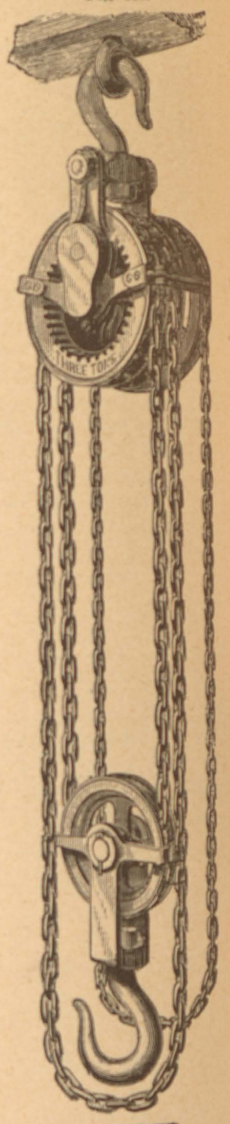
PRICE LIST OF GEARED BLOCKS.

CAPACITY.	PRICE. Complete with reg'lar l'gth Chains BOXED.	CHAIN. REGULAR LENGTHS. Main Chain.	CHAIN. REGULAR LENGTHS. Hand Chain.	CHAIN. Price of extra Main Chain per ft.	HOIST. See Note.*	NET WEIGHT. Complete.
1 Ton.	$ 40	22 ft.	16 ft.	$ .44	8 ft.	62 lbs.
2 "	65	24 "	18 "	.52	9 "	109 "
3 "	90	26 "	20 "	.60	10 "	159 "
4 "	120	28 "	22 "	.70	11 "	257 "
5 "	150	30 "	24 "	.80	12 "	324 "
6 "	200	32 "	26 "	1.00	13 "	493 "
8 "	275	36 "	28 "	1.25	14 "	735 "
10 "	350	40 "	30 "	1.50	16 "	1054 "

EXTRA LENGTH OF CHAINS.—For each foot of extra hoist allow two and a half feet of Main Chain and two feet of Hand Chain.

EXTRA HAND CHAIN, 40 cents per foot.

Fig. 168.



GEARED

One man can lift from 2,000 to 5,000 pounds

They hold the load at any point and cannot run down.

Lifting and lowering effected by pulling opposite sides of the slack Chain.

Easy and smooth in action—light and convenient to handle.

*NOTE.—Figures in the fifth and sixth columns denote approximate height which Blocks, with regular lengths of Chain will hoist from level on which operator stands.

ROPE STRAPPED BLOCKS.

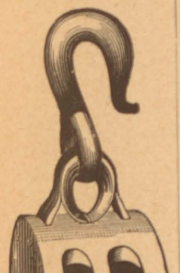
Fig. 169.

DIMENSIONS.			IRON BUSHED.			ROLLER BUSHED.		
Sheave.	Rope.	Shell. Length.	Single.	Double.	Triple.	Single.	Double.	Triple.
1¾ x ½	5/16	3	$ 0 65	$ 1 10	$ 1 60	$ 1 00	$ 1 90	$ 2 70
2 x ½	5/16	3½	70	1 15	1 65	1 10	1 95	2 80
2¼ x 10/16	5/16	4	75	1 25	1 75	1 15	2 10	3 00
3 x 13/16	5/16	5	90	1 65	2 00	1 30	2 35	3 50
3½ x 15/16	5/16	6	1 05	1 90	2 40	1 65	3 00	4 00
4⅜ x 1 1/16	5/16	7	1 25	2 25	2 75	1 90	3 50	4 75
5 x 1 3/16	1	8	1 60	2 75	3 50	2 50	4 00	5 50
5¾ x 1 3/16	1	9	2 00	3 25	4 40	2 75	4 75	6 50
6¼ x 1 5/16	1⅛	10	2 40	3 75	5 40	3 25	6 00	8 50
7⅜ x 1 5/16	1⅛	11	3 00	5 00	7 00	4 00	7 00	10 25
8 x 1⅜	1¼	12	3 50	6 00	7 50	4 75	8 25	12 25
8⅜ x 1⅜	1¼	13	4 00	6 75	9 25	5 25	9 25	14 00
9 x 1½	1⅜	14	4 50	7 75	11 50	6 00	10 50	15 50

Fig. 170.

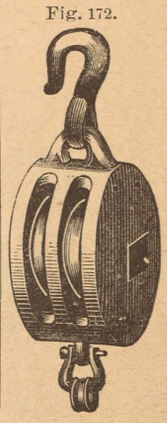
INSIDE IRON STRAPPED BLOCKS.

Fig. 171.



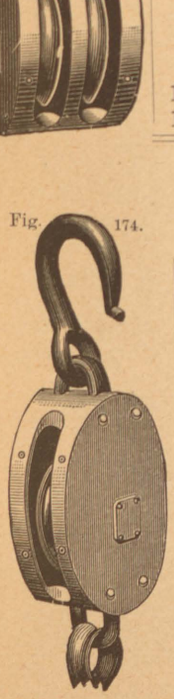
DIMENSIONS.			COMMON IRON BUSHED.			PATENT ROLLER BUSHED.		
Sheave.	Rope.	Shell. Lenght.	Single.	Double.	Triple.	Single.	Double.	Triple.
1¾ x ½	5/16	3	$ 0 75	$ 1 25		$ 1 10	$ 2 10	
2 x ½	3/8	3½	80	1 40	$ 2 25	1 15	2 20	$ 3 25
2¼ x 10/16	½	4	90	1 60	2 50	1 25	2 40	3 50
3 x 13/16	½	5	1 10	2 00	2 90	1 60	3 00	4 60
3½ x 15/16	½	6	1 40	2 50	3 50	2 00	3 80	5 45
4⅜ x 1 1/16	⅝	7	1 60	2 75	4 00	2 30	4 50	6 25
5 x 1 3/16	1	8	1 90	3 50	4 75	2 80	5 20	7 15
5¾ x 1 3/16	1	9	2 20	4 00	5 25	3 20	5 80	8 00
6¼ x 1 5/16	1⅛	10	2 75	4 75	6 00	3 90	6 65	9 25
7⅜ x 1 5/16	1⅛	11	3 15	5 50	7 50	4 40	7 50	10 75
8 x 1⅜	1¼	12	3 50	6 50	8 50	5 00	8 50	12 50
8⅝ x 1⅜	1¼	13	4 00	7 00	10 00	5 65	9 60	14 25
9 x 1½	1⅜	14	4 50	8 00	12 00	6 15	10 80	16 00
10 x 1⅝	1½	15	5 25	9 25	13 75	7 00	12 25	17 75
10½ x 1¾	1⅝	16	6 75	11 50	17 00	8 50	15 00	20 50

Fig. 172.



HEAVY TACKLE, THICK MORTISE BLOCKS.

Fig. 174.



For Railroads, Mining, and other extra heavy work.

DIMENSIONS.			COMMON IRON BUSHED.			PAT. ROLLER BUSHED.		
Sheave.	Rope.	Shell. L'ngth	Single.	Double.	Triple.	Single.	Double.	Triple.
3½ x 1 1/16	⅞	6	$ 2 00	$ 3 75	$ 5 25	$ 2 80	$ 4 90	$ 7 10
4⅜ x 1 3/16	1	7	2 30	4 40	6 10	3 30	5 75	8 30
5 x 1 5/16	1⅛	8	2 65	5 00	7 00	3 75	6 50	9 50
5¾ x 1 7/16	1¼	9	3 00	5 50	8 00	4 25	7 25	10 00
6¼ x 1½	1⅜	10	3 75	6 35	9 50	5 00	9 00	12 75
7⅜ x 1½	1⅜	11	4 25	7 50	11 00	5 75	10 25	14 50
8 x 1⅝	1½	12	5 00	9 00	12 50	6 75	11 75	16 50
8⅝ x 1⅝	1½	13	5 50	10 00	14 00	7 50	13 25	18 50
9 x 1¾	1⅝	14	6 25	11 50	16 00	8 25	14 75	20 50
10 x 1⅞	1¾	15	8 00	13 50	19 00	10 00	17 00	23 50
10 x 2⅛	2	16	10 00	18 00	27 00	12 00	21 50	33 50
11½ x 2⅜	2¼	18	15 00	28 00	36 00	.....	.....	.....
12 x 2⅜	2¼	20	20 00	36 00	44 00	.....	.....	.....

Fig. 173.

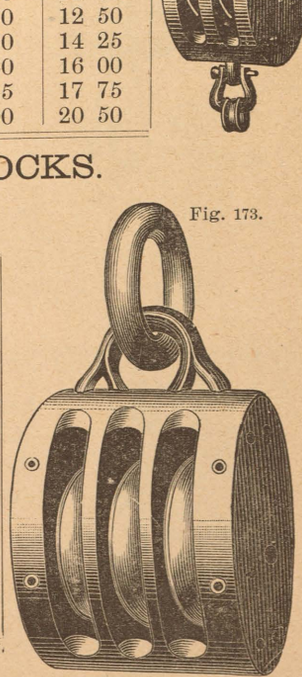
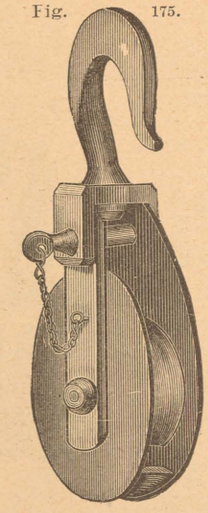


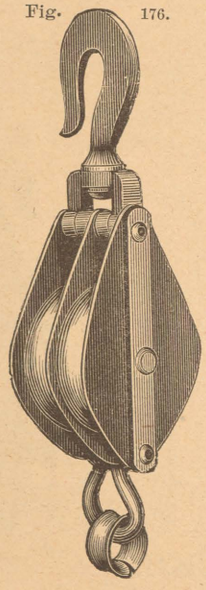
Fig. 175.



SNATCH BLOCKS.

Wood Shell Inside Iron Strapped.			Wrought Iron Shell.		
Size.	Rope.	Price.	Size.	Rope.	Price.
6	$\frac{7}{8}$	3 80	7	$\frac{7}{8}$	5 25
7	$\frac{7}{8}$	4 25	8	1	6 35
8	1	5 25	9	$1\frac{1}{8}$	7 50
9	$1\frac{1}{8}$	6 25	10	$1\frac{1}{4}$	9 00
10	$1\frac{1}{4}$	7 35	12	$1\frac{1}{2}$	11 00
12	$1\frac{1}{2}$	8 50	14	$1\frac{3}{4}$	14 00
14	$1\frac{3}{4}$	10 50	16	2	19 00
16	2	12 50	18	$2\frac{1}{4}$	25 00
18	$2\frac{1}{4}$	17 50	20	$2\frac{1}{2}$	36 00
20	$2\frac{1}{2}$	25 00			

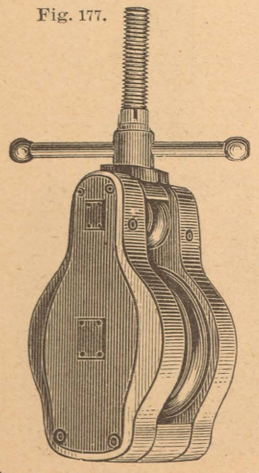
Fig. 176.



WROUGHT IRON TACKLE BLOCKS.

Sheave.	Rope.	Chain.	Shell. Length.	Single.	Double.	Triple.
$3\frac{1}{2}$x $\frac{1}{16}$	$\frac{5}{8}$	.....	6	$ 2 35	$ 3 75	$ 4 60
4 x $\frac{3}{16}$	$\frac{3}{4}$	.....	7	3 10	4 60	5 85
$4\frac{1}{2}$x $\frac{5}{16}$	1	.....	8	4 00	5 85	7 50
5 x1$\frac{3}{16}$	1	$\frac{3}{16}$	9	5 35	8 20	10 50
6 x1$\frac{5}{16}$	$1\frac{1}{8}$	$\frac{1}{4}$	10	6 20	10 50	13 50
7 x1$\frac{1}{2}$	$1\frac{1}{4}$	$\frac{5}{16}$	12	7 60	13 50	17 25
8 x1$\frac{3}{4}$	$1\frac{1}{2}$	$\frac{3}{8}$	14	10 50	20 00	27 00
9 x2	$1\frac{3}{4}$	$\frac{1}{2}$	16	16 70	27 50	38 50
10 x2$\frac{1}{4}$	2	$\frac{9}{16}$	18	28 50	43 00	58 50
11 x2$\frac{5}{8}$	$2\frac{1}{2}$	$\frac{5}{8}$	20	38 60	58 50	86 00

Fig. 177.



DOCK BLOCKS.

Length....	10	12	14	16	20
Mortise....	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Rope.....	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....	$ 9 00	$ 10 00	$ 11 00	$ 14 00	$ 22 00

SHEAVES FOR OUR REGULAR BLOCKS.

IRON.

Size of Sheave.	Hole for Pin. Full Size.	For Block.	Common.	Pat. Steel Rollers.
1¼x ⅜	¼	2½	$ 0 06	$ 0 40
1⅜x ½	¼	3	07	43
2 x ½	¼	3½	08	46
2¼x ⅝	⅜	4	10	50
2¾x 5	⅜	4½	13	55
3 x 13/16	⅜	5	15	60
3¼x 13/16	½	6	20	70
4⅜x 1 1/16	½	7	30	80
5 x 1 3/16	⅝	8	40	1 10
5 x 1 1/16	⅝	Thick 8	45	1 25
5⅜x 1 3/16	⅝	9	50	1 20
5¾x 1 7/16	⅝	Thick 9	55	1 50
6¼x 1 1/16	⅝	10	60	1 50
6¼x 1½	*⅝ and ¾	Thick 10	70	1 75
7⅜x 1 5/16	¾	11	80	1 75
8 x 1⅜	¾	12	1 00	2 00
8 x 1⅝	*¾ and ⅞	Thick 12	1 20	2 25
8⅝x 1⅜	¾	13	1 20	2 30
9 x 1½	¾	14	1 30	2 55
9 x 1¾	*¾ and ⅞	Thick 14	1 50	3 00
10 x 1⅜	⅞	15	1 50	3 00
10 x 1⅝	⅞	Thick 15	1 70	3 50
10½x 1¾	⅞	16	1 70	3 50
10½x 2	*⅞ and 1	Thick 16	2 00	4 25

* First size gives the hole in Common, second in Patent.

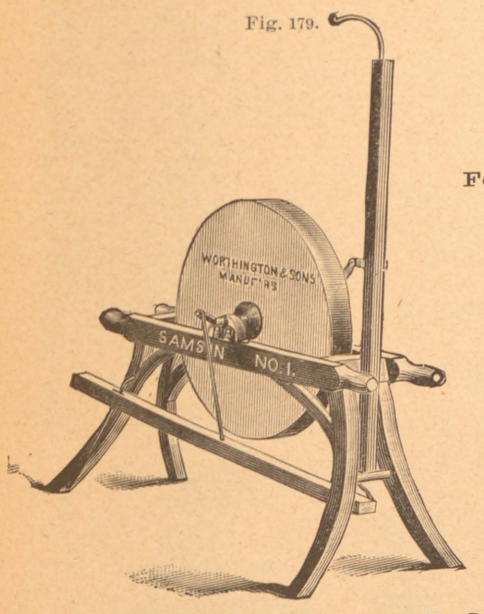
LIGNUM VITÆ.

Size of Sheave.	Hole for Pin. Full Size.	For Block.	Common.	Pat. Steel Rollers.
1¾x ½	¼	3	$ 0 10	.....
2 x ½	¼	3½	12	$ 0 53
2¼x ⅝	†¼ and ⅜	4	15	55
3 x 13/16	⅜	5	20	60
3½x 1 1/16	½	6	25	70
4⅜x1 1/16	½	7	30	80
5 x1 3/16	⅝	8	40	1 10
5 x1 1/16	⅝	Thick 8	45	1 25
5¾x1 3/16	⅝	9	50	1 20
5¾x1 7/16	⅝	Thick 9	55	1 50
6¼x1 1/16	⅝	10	60	1 50
6¼x1½	†⅝ and ¾	Thick 10	70	1 75
7⅜x1 5/16	¾	11	80	1 75
8 x1⅜	¾	12	1 00	2 00
8 x1⅝	†¾ and ⅞	Thick 12	1 20	2 25
8⅝x1⅜	¾	13	1 20	2 30
9 x1½	¾	14	1 30	2 55
9 x1¾	†¾ and ⅞	Thick 14	1 50	3 00
10 x1⅝	⅞	15	1 50	3 00
10 x1⅞	⅞	Thick 15	1 70	3 50
10½x1¾	⅞	16	1 70	3 50
10½x2	†⅞ and 1	Thick 16	2 00	4 25

† First size gives the hole in Common, second in Patent.

We are prepared to furnish on short notice most any sizes of Lignum Vitæ or Iron Sheaves, Plain Bushed, or Steel Roller Bushed.

Fig. 179.



GRINDSTONES.

(MOUNTED).

For Shop, Farm and Household Use.

SAMSON.

No. 1, per doz.	$ 48 00
No. 2, "	40 00
No. 3, "	32 00

ECLIPSE.

No. 1, per doz.	$ 56 00
No. 2, "	48 00
No. 3, "	40 00

Fig. 178.

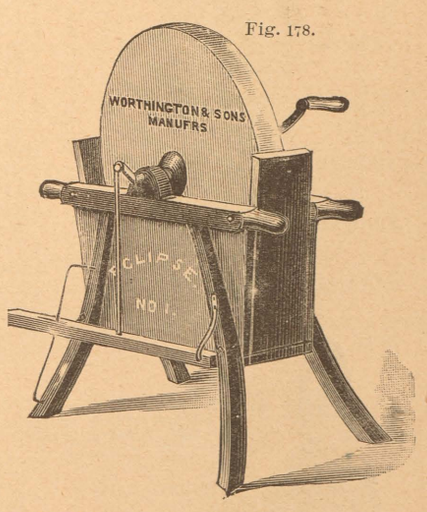
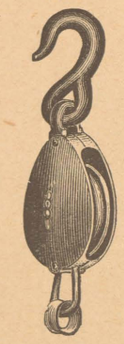


TABLE OF WEIGHTS OF GRINDSTONES.

Feet in Diameter.....		2 ft.	2ft. 3in.	2ft. 6in.	2ft. 9in.	3 ft.	3ft. 3in.	3ft. 6in.	3ft. 9in.	4 ft	4ft. 3in.	4ft. 6in.	4ft. 9in.	5 ft.
Inches in thickness	2	73	92	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	2½	91	116	143	173	.....	.....	.....	.....	.....	.....	.....	.....	.....
	3	110	139	171	207	247	290	.....	.....	.....	.....	.....	.....	.....
	3½	128	162	200	242	288	338	392	.....	.....	.....	.....	.....	.....
	4	146	185	229	277	329	387	448	515	.....	.....	.....	.....	.....
	4½	.....	.....	.....	.....	371	435	505	579	659	.....	.....	.....	.....
	5	.....	.....	.....	.....	412	483	561	644	733	827	.....	.....	.....
	5½	.....	.....	.....	.....	.....	.....	.....	708	806	910	1020	1137	.....
	6	.....	.....	.....	.....	.....	.....	.....	773	879	993	1122	1240	.....
	6½	.....	.....	.....	.....	.....	.....	.....	.....	.....	1075	1205	1343	1488
	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1298	1447	1603

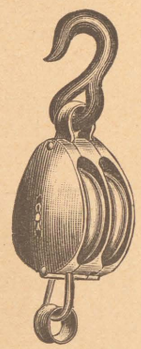
MALLEABLE IRON TACKLE BLOCKS.

Fig. 180.



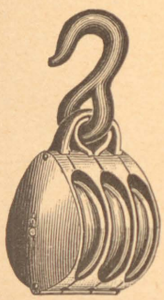
Single, Com'on Hook and Becket, Plain or Roller Bushed.

Fig. 181.



Double, Com'on Hook and Becket, Plain or Roller Bushed.

Fig. 182.



Triple, Common Hook no Becket, Plain or Roller Bushed.

Fig. 183.

Double, Match Hooks no Becket, Plain or Roller Bushed.

Fig. 184.

Triple, Common Hook and Becket, Plain or Roller Bushed.

MALLEABLE IRON TACKLE BLOCKS.

PLAIN BUSHING.

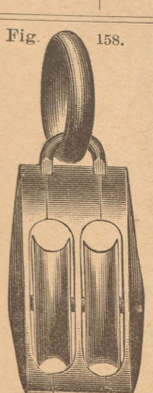
Length of Shell.	Size of Sheave.	Diam'ter of Rope.		PRICE.
4 inch.	2¼ x 1 1/16	½	Single..	$ 1 00
			Double	2 00
			Triple.	3 00
5 inch.	2¾ x ⅞	⅝	Single.	1 35
			Double.	2 50
			Triple.	3 50
6 inch.	3⅜ x 1	¾	Single.	1 75
			Double.	3 00
			Triple.	4 00
7 inch.	4¼ x 1⅛	⅞	Single.	2 10
			Double.	3 65
			Triple.	4 80
8 inch.	4⅞ x 1¼	1	Single.	2 60
			Double.	4 75
			Triple.	6 00
9 inch.	5½ x 1¼	1 1/16	Single.	3 20
			Double.	5 25
			Triple.	7 25
10 inch.	6 x 1⅜	1⅛	Single.	3 70
			Double.	6 00
			Triple.	8 00
12 inch.	7½ x 1½	1¼	Single.	4 50
			Double.	7 50
			Triple.	10 50
14 inch.	8¾ x 1⅝	1⅜	Single.	6 25
			Double.	10 50
			Triple.	14 00

MALLEABLE IRON TACKLE BLOCKS.

PATENT STEEL ROLLER BUSHING.

Length of Shell.	Size of Sheave.	Diam'ter of Rope.		PRICE.
4 inch.	2¼ x 1 1/16	½	Single.	$ 1 50
			Double.	2 90
			Triple.	4 00
5 inch.	2¾ x ⅞	⅝	Single.	2 00
			Double.	3 80
			Triple.	5 50
6 inch.	3⅜ x 1	¾	Single.	2 50
			Double.	4 55
			Triple.	6 55
7 inch.	4¼ x 1⅛	⅞	Single.	2 95
			Double.	5 45
			Triple.	7 65
8 inch.	4⅞ x 1¼	1	Single.	3 35
			Double.	6 25
			Triple.	8 55
9 inch.	5½ x 1¼	1 1/16	Single.	3 80
			Double.	7 00
			Triple.	9 85
10 inch.	6 x 1⅜	1⅛	Single.	4 20
			Double.	7 80
			Triple.	10 95
12 inch.	7½ x 1½	1¼	Single.	5 35
			Double.	10 00
			Triple.	13 75
14 inch.	8¾ x 1⅝	1⅜	Single.	6 75
			Double.	12 50
			Triple.	17 50

Fig. 158.



Length of Shell.	Size of Sheave.	Diam. of Rope.		PRICE.
10 inch	6x1⅝	1⅜	Single.	$ 4 00
			D'uble.	7 50
			Triple.	10 50
12 inch	7¼x1¾	1½	Single.	5 30
			D'uble.	9 90
			Triple	13 75
14 inch	8½x1⅞	1¾	Single.	6 70
			Du'ble.	12 25
			Triple.	17 50
16 inch	10x2	1⅞	Single.	9 75
			D'uble.	16 25
			Triple.	22 50
18 inch	.....	.....	.....	.....
20 inch	.....	.....	.....	.....

Wide Mortise and Heavy Purchase, with Rings, Hooks or Shackles.

Fig. 186.

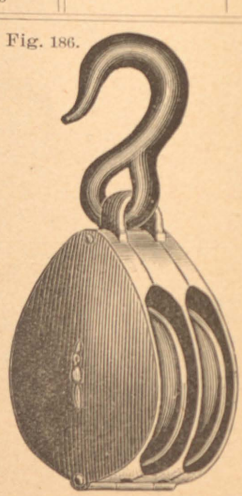
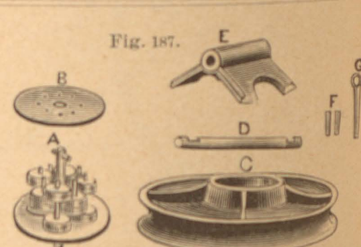


Fig. 187.



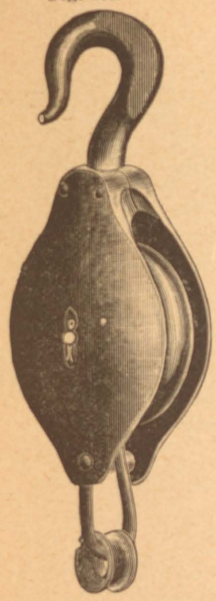
DESCRIPTION OF CUT.

A—Combination Steel Roller Bushing.
B—Steel Washer to hold Bushing in place.
C—Sheave.
D—Key Pin to hold end E in place.
E—End of Block.
F—Keys to fit Pin D.
G—Split Key for Sheave pin.

To remove the Sheave, simply take out the Split Key in Pin and remove the end piece E.

MALLEABLE IRON TACKLE BLOCKS.

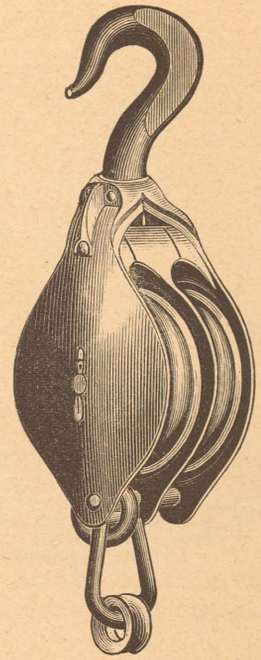
Fig. 188.



WIDE MORTISE BLOCKS WITH STIFF SWIVEL HOOKS.—PLAIN BUSHING.

Length of Shell.	Size of Sheave.	Diameter of Rope.		PRICE.
8 inch.	$4\frac{7}{8}$ x $1\frac{1}{2}$	$1\frac{1}{8}$	Single.....	$ 2 75
			Double.....	4 75
			Triple.....	6 25
10 inch.	6 x $1\frac{5}{8}$	$1\frac{3}{8}$	Single.....	4 00
			Double.....	7 50
			Triple.....	10 50
12 inch.	$7\frac{1}{2}$ x $1\frac{3}{4}$	$1\frac{1}{2}$	Single.....	5 30
			Double.....	9 90
			Triple.....	13 75
14 inch.	$8\frac{3}{4}$ x $1\frac{7}{8}$	$1\frac{3}{4}$	Single.....	6 70
			Double.....	12 25
			Triple.....	17 50
16 inch.	10 x 2	$1\frac{7}{8}$	Single.....	9 75
			Double.....	16 25
			Triple.....	22 50

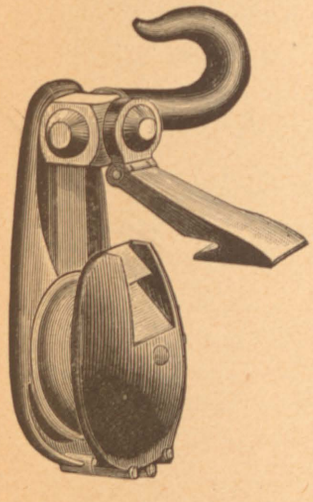
Fig. 189.



PATENT AUTOMATIC SNATCH BLOCKS.

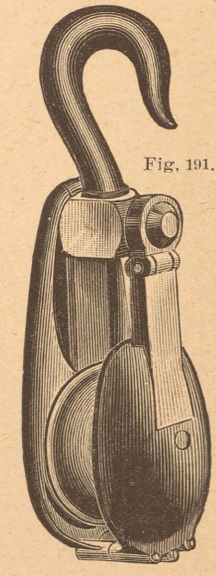
These Blocks are peculiarly adapted for use where a heavy strain is required, as in mines, quarries, etc., and for strength have no equal.

Fig. 190.



Length of Shell.	Size of Sheave.	Diameter of Rope.	PRICE,
8 inch.	4 x 1	1	$ 6 50
10 inch.	$5\frac{1}{2}$ x $1\frac{7}{8}$	$1\frac{1}{4}$	9 50
12 inch.	7 x 2	$1\frac{1}{2}$	11 50
14 inch.	8 x $2\frac{1}{4}$	$1\frac{3}{4}$	14 25
16 inch.	9 x $2\frac{1}{2}$	2	18 75
18 inch.	10 x 3	$2\frac{1}{2}$	22 75
20 inch.	11 x $3\frac{1}{2}$	3	28 50

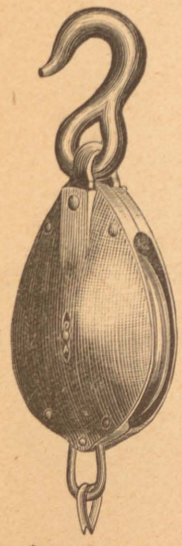
Fig. 191.



MALLEABLE IRON TACKLE BLOCKS FOR WIRE ROPE.

Length of Shell.	Size of Sheave.	Diameter of Wire.		PRICE.
14 inch.	10 x $1\frac{1}{2}$	$\frac{1}{2}$@$\frac{5}{8}$	Single.....	$ 7 50
			Double.....	13 50
			Triple.....	19 50
16 inch.	11 x $1\frac{3}{4}$	$\frac{5}{8}$@$\frac{3}{4}$	Single.....	10 50
			Double.....	19 00
			Triple.....	25 00
18 inch.	13 x 2	$\frac{7}{8}$@1	Single.....	13 00
			Double.....	25 00
			Triple.....	35 50
20 inch.	.....	.....	.....	.....
24 inch.	.....	.....	.....	.....
30 inch.	.....	.....	.....	.....

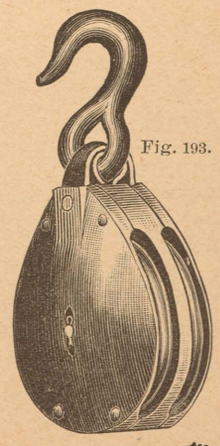
Fig. 192.



SHEAVES FOR MALLEABLE IRON BLOCKS.

Dimensions.		Size of Pin Hole.	Size of Block.	PRICE.	
Diameter.	Thickness.			Plain Bush'd	Roll'r Bush'd
$2\frac{1}{4}$	$\frac{11}{16}$	$\frac{3}{8}$	4 in.	$ 10	$ 40
$2\frac{3}{4}$	$\frac{7}{8}$	$\frac{7}{16}$	5 in.	13	50
$3\frac{3}{8}$	1	$\frac{1}{2}$	6 in.	20	60
$4\frac{1}{4}$	$1\frac{1}{8}$	$\frac{9}{16}$	7 in.	30	70
$4\frac{7}{8}$	$1\frac{1}{4}$	$\frac{5}{8}$	8 in.	40	1 00
$5\frac{1}{2}$	$1\frac{1}{4}$	$\frac{11}{16}$	9 in.	50	1 10
6	$1\frac{3}{8}$	$\frac{3}{4}$	10 in.	60	1 40
$7\frac{1}{2}$	$1\frac{1}{2}$	$\frac{7}{8}$	12 in.	1 00	1 90
$8\frac{3}{4}$	$1\frac{5}{8}$	1	14 in.	1 25	2 40

Fig. 193.



CORDAGE.

Fig. 194.

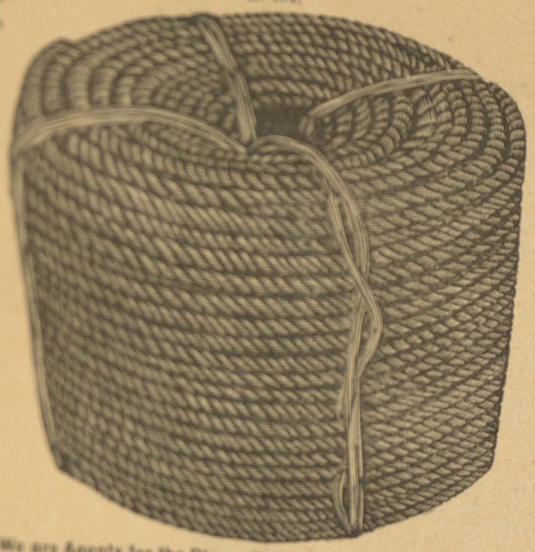
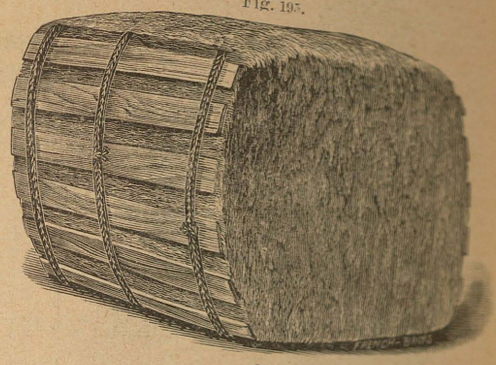


Fig. 195.



OAKUM.

We are Agents for the Plymouth Cordage Co.'s Celebrated Boston Rope and Lath Yarn.

TABLE SHOWING ESTIMATED WEIGHT AND STRENGTH OF CORDAGE.

Circumference in Inches.	Diameter in Inches.	MANILLA CORDAGE. Weight per Coil of 140 Fathoms. Lbs.	Weight per Fathom. Lbs.	Strain borne by New Manilla Rope. Lbs.	No. Feet in one Pound.	TARRED HEMP CORDAGE. Weight per Coil of 140 Fathoms. Lbs.	Weight per Fathom. Lbs.
Six Thread, ¾ inch.	¼	20	....	450	38	25	
Nine " 1 "	5-16	30	....	750	28	37	
Twelve " 1½ "	⅜	40	....	900	22	50	
Fifteen " 1¼ "	7-16	45	....	1,250	17	56	
" " 1⅜ "	½	65	½	1,700	12	81	
" " 1½ "	9-16	85	⅝	2,250	10	106	¾
" " 2 "	⅝	115	8-10	3,000	7½	140	1
" " 2¼ "	¾	145	1	4,000	6	175	1¼
" " 2½ "	13-16	185	1 3-10	5,000	5	230	1⅝
" " 2¾ "	⅞	210	1½	5,800	4	260	1⅞
" " 3 "	1	255	1¾	7,000	3½	320	2¼
" " 3¼ "	1 1-16	300	2⅛	8,000	2¾	375	2⅝
" " 3½ "	1⅛	340	2½	9,200	2⅓	425	3
" " 3¾ "	1¼	390	2¾	11,000	2 1-16	485	3½
" " 4 "	1 5-16	450	3¼	12,000	1⅞	560	4
" " 4¼ "	1⅜	500	3⅝	13,500	1⅔	625	4½
" " 4½ "	1 7-16	565	4	15,500	1 5-12	700	5
" " 4¾ "	1½	625	4½	17,000	1¼	780	5½
" " 5 "	1⅝	700	5	19,000	1 1-6	850	6
" " 5¼ "	1 11-16	775	5½	21,500	1 1-12	970	7
" " 5½ "	1¾	850	6	23,500	1 Inches.	1,060	7½
" " 5¾ "	1 13-16	925	6⅝	25,000	11	1,150	8¼
" " 6 "	1⅞	1,010	7¼	27,000	10	1,250	9
" " 6½ "	2 1-16	1,200	8½	31,500	8½	1,500	10½
" " 7 "	2¼	1,375	10	37,000	7½	1,720	12¼
" " 7½ "	2⅜	1,600	11½	42,000	6½	2,000	13½
" " 8 "	2 9-16	1,820	13	48,000	5½	2,275	16
" " 8½ "	2¾	2,050	14⅝	54,000	5	2,550	18
" " 9 "	2⅞	2,320	16½	61,000	4½	2,900	20½

MANILLA ROPE.

1½ cir., or 7-16 diameter, and upwards
12 Thread, or ⅜ diameter
6 and 9 Thread, or ¼ to 5-16 diameter
Hay Rope
Hide Rope
Bolt Rope and Point Rope
Lath Yarn (single), in strands
" (double) "
Spun Yarn, 2 and 3-yarn, tarred
Shingle Yarn, 2-yarn, strapped

OAKUM.

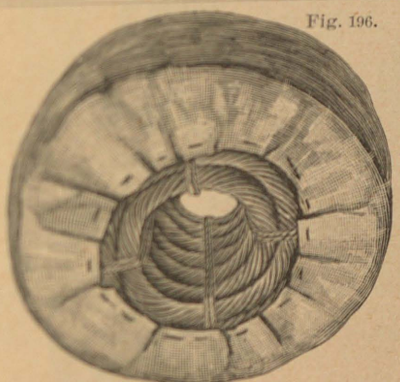
Best Oakum
U. S. Navy Oakum
Navy Oakum
Spun Cotton
Calking Cotton

SISAL ROPE.

1¼ cir., or 7-16 diameter or upwards
12 Thread, or ⅜ diameter
6 and 9 Thread, ¼ and 5-16 diameter
Hay Rope
Hide Rope
Lath Yarn (single) in strands
" (double) "
Clapboard and Shingle Yarn

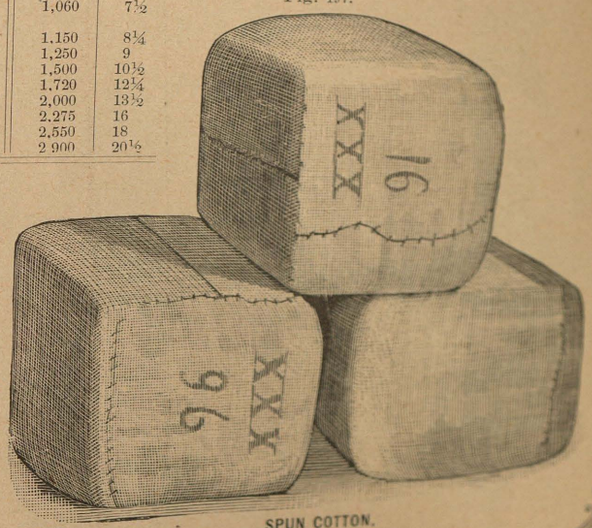
Russia Bolt Rope
Tarred Rope
Marline, Houseline and Hambroline
Bell Cord
Cotton Rope

Fig. 196.



LATH YARN.

Fig. 197.



SPUN COTTON.

Fig. 198.

CHARCOAL WIRE ROPE IRON ROPE.

STANDARD HOISTING ROPES
WITH 19 WIRES TO THE STRAND.
IRON.

DIAMETER.	Weight per foot in lbs. of Rope with Hemp Cen.	Breaking strain in tons of 2,000 lbs.	Proper work'g load in tons of 2,000 lbs.	Circ'ference of Hemp Rope of eq'l strength.	Minimum size of Drum or Sheave in feet.	Price per ft. in cents.
2½	8.00	74	15	15½	8	90
2	6.30	65	13	14½	7	67
1¾	5.25	54	11	13	6½	59
1½	4.10	44	9	12	5	50
1⅜	3.65	39	8	11½	4¾	45
1¼	3.00	33	6½	10¼	4½	37
1⅛	2.50	27	5½	9½	4	31
1	2.00	20	4	8	3½	25
⅞	1.58	16	3	7	3	22
¾	1.20	11.50	2½	6	2¾	17
⅝	0.88	8.64	1¾	5	2½	14
½	0.70	5.13	1¼	4½	2	12
9-16	0-44	4.27	¾	4	1¾	10
⅜	0.35	3.48	½	3½	1½	8

Filler Rope, ⅜ inch diameter, 14 cts. per foot; ½ inch diameter, 10 cts. per foot.

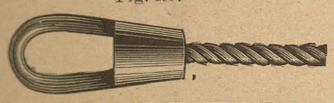
TRANSMISSION AND STANDING ROPES
WITH 7 WIRES TO THE STRAND.
IRON.

DIAMETER.	Weight per foot in lbs. of Rope with Hemp Cen.	Breaking strain in tons of 2,000 lbs.	Proper work'g load in tons of 2,000 lbs.	Circ'ference of Hemp Rope of eq'l strength.	Price per ft. in cents.
1½	3.37	36	9	10¾	41
1⅜	2.77	30	7½	10	33
1¼	2.28	25	6¼	9¼	29
1⅛	1.82	20	5	8	23
1	1.50	16	4	7	20
⅞	1.12	12.3	3	6¼	16
¾	0.88	8.8	2¼	5¼	12
11-16	0.70	7.6	2	5	10
⅝	0.57	5.8	1½	4¾	9
9-16	0.41	4.1	1	4	7
½	0.31	2.83	¾	3¼	6
7-16	0.23	2.13	½	2¾	4½
⅜	0.19	1.65	....	2½	4
5-16	0.16	1.38	....	2¼	3½
9-32	0.125	1.03	....	2	3

NOTE.—The prices given are for *Hemp Center Ropes*. When made with *Wire Center*, the price per foot is 10 per cent. extra. The weight of Wire Center Ropes is 10 per cent. more than that of Ropes with Hemp Centers.

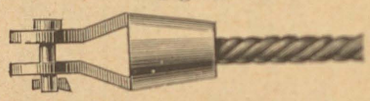
WIRE ROPE FASTENINGS.

Fig. 199.



CLOSED SOCKET—ATTACHED.

Fig. 200.

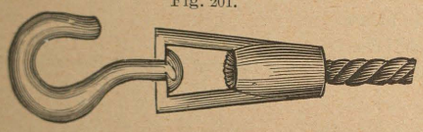


OPEN SOCKET—ATTACHED.

SIZE.	LOOSE.	ATTACHED.
⅜ inch Rope	$2 00	$ 4 00
½ " "	2 50	4 50
⅝ " "	3 00	5 00
¾ " "	3 50	5 50
⅞ " "	4 00	6 50
1 " "	4 50	7 50
1⅛ " "	5 00	8 00
1¼ " "	5 50	9 00
1⅜ " "	6 00	10 00
1½ " "	6 50	10 50

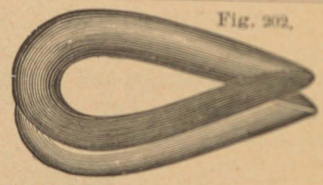
SIZE.	LOOSE.	ATTACHED.
⅜ inch Rope	$2 50	$ 4 50
½ " "	3 00	5 00
⅝ " "	3 50	5 50
¾ " "	4 50	6 50
⅞ " "	5 00	7 50
1 " "	6 00	8 50
1⅛ " "	6 50	9 50
1¼ " "	7 00	10 50

Fig. 201.



SOCKET AND SWIVEL HOOK.

Fig. 202.



WIRE ROPE THIMBLE.

SIZE.	LOOSE.	ATTACHED.
⅜ inch Rope	$ 5 50	$ 7 50
½ " "	6 00	8 00
⅝ " "	6 50	8 50
¾ " "	7 50	9 50
⅞ " "	8 00	10 50
1 " "	8 50	11 00
1⅛ " "	9 00	11 50
1¼ " "	11 50	14 50
1⅜ " "	12 50	16 00
1½ " "	16 00	19 50

SIZE.	LOOSE.	SPLICED.
⅜ inch Rope	$ 40	$ 1 00
½ " "	50	2 00
⅝ " "	60	2 50
¾ " "	1 00	3 00
⅞ " "	1 20	3 50
1 " "	1 40	4 00
1⅛ " "	1 50	4 50
1¼ " "	1 60	5 00
1⅜ " "	2 00	6 50
1½ " "	2 20	7 00

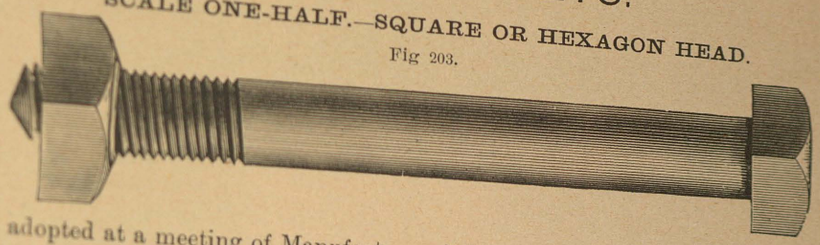
WIRE ROPE CLAMPS.

⅜ inch Rope, each	$ 50	1 inch Rope, each	
½ " " "	60	1⅛ " " "	$1 10
⅝ " " "	70	1¼ " " "	1 50
¾ " " "	80	1⅜ " " "	1 80
⅞ " " "	1 00	1½ " " "	2 20
			2 50

MACHINE BOLTS.

SCALE ONE-HALF.—SQUARE OR HEXAGON HEAD.

Fig 203.



Revised List, adopted at a meeting of Manufacturers held at New York, June 25th, 1879.

PRICE PER HUNDRED.

Length.	1/4	5/16	3/8	7/16	1/2	9/16 & 5/8	3/4	7/8	1
1½	2 80	3 20	3 60	4 60	5 00	7 20	10 50	14 90	22 00
2	2 90	3 35	3 80	4 90	5 30	7 70	11 10	15 80	23 10
2½	3 00	3 50	4 00	5 20	5 60	8 20	11 70	16 60	24 20
3	3 10	3 65	4 20	5 50	5 90	8 70	12 30	17 50	25 30
3½	3 20	3 80	4 40	5 80	6 20	9 20	12 90	18 30	26 40
4	3 30	3 95	4 60	6 10	6 50	9 70	13 50	19 20	27 50
4½	3 40	4 10	4 80	6 40	6 80	10 20	14 10	20 00	28 60
5	3 50	4 25	5 00	6 70	7 10	10 70	14 70	20 90	29 70
5½	3 60	4 40	5 20	7 00	7 40	11 20	15 30	21 70	30 80
6	3 70	4 55	5 30	7 30	7 70	11 70	15 90	22 60	31 90
6½	3 80	4 70	5 60	7 60	8 00	12 20	16 50	23 40	33 00
7	3 90	4 85	5 80	7 90	8 30	12 70	17 10	24 30	34 10
7½	4 00	5 00	6 00	8 20	8 60	13 20	17 70	25 10	35 20
8	4 10	5 15	6 20	8 50	8 90	13 70	18 30	26 00	36 30
9	.....	.....	6 60	9 10	9 50	14 75	19 50	27 70	38 50
10	.....	.....	7 00	9 70	10 10	15 75	20 70	29 40	40 70
11	.....	.....	7 40	10 30	10 70	16 75	21 90	31 10	42 90
12	.....	.....	7 80	10 90	11 30	17 75	23 10	32 80	45 10
13	.....	.....	.....	.....	11 90	18 75	24 30	34 50	47 30
14	.....	.....	.....	.....	12 50	19 75	25 50	36 20	49 50
15	.....	.....	.....	.....	13 10	20 75	26 70	37 90	51 70
16	.....	.....	.....	.....	13 70	21 75	27 90	39 60	53 90
17	.....	.....	.....	.....	14 30	22 75	29 10	41 30	56 10
18	.....	.....	.....	.....	14 90	23 75	30 30	43 00	58 30
19	.....	.....	.....	.....	15 50	24 75	31 50	44 70	60 50
20	.....	.....	.....	.....	16 10	25 75	32 70	46 40	62 70

Bolts with Hexagon Heads or Hexagon Nuts, 10 per cent. extra.
If both Hexagon Heads and Hexagon Nuts, 20 per cent. extra.
When larger quantities are ordered we make no additional charge for Hexagon Heads, but for Hexagon Nuts we must charge extra.

Fig. 204.

BOLT ENDS, WITH SQUARE NUTS.

Size of Iron.....	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
Length.....	6	7	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Price per lb.....	28	24	20	16	14	12				14			16			

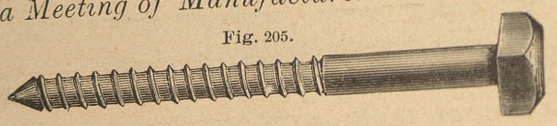
BRIDGE BOLTS OR GANG BOLTS.

All sizes and kinds furnished upon application. Also large Cast Washers for same.

COACH OR LAG SCREWS.

Revised List adopted at a Meeting of Manufacturers held at New York, June 25th, 1879.

Fig. 205.



Length.	PRICE PER HUNDRED.							
	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ and $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1½	$2 70	$3 10	$4 00	$ 4 30				
2	2 90	3 30	4 25	4 60	$ 6 50			
2½	3 10	3 50	4 50	4 90	6 90	10 00		
3	3 30	3 70	4 75	5 20	7 30	10 50	15 00	
3½	3 50	3 90	5 00	5 50	7 70	11 00	15 75	21 00
4	3 70	4 10	5 25	5 80	8 10	11 50	16 50	22 50
4½	3 90	4 30	5 50	6 10	8 50	12 00	17 25	23 40
5	4 10	4 50	5 75	6 40	8 90	12 50	18 00	24 25
5½	4 30	4 70	6 00	6 70	9 30	13 00	18 75	25 25
6	4 50	4 90	6 25	7 00	9 70	13 50	19 50	26 25
7			6 75	7 60	10 50	14 50	21 00	28 25
8			7 25	8 20	11 30	15 50	22 50	30 25
9			7 75	8 80	12 10	16 50	24 00	32 25
10				9 40	12 90	17 50	25 50	34 25
11				10 00	13 70	18 50	27 00	36 25
12				10 60	14 50	19 50	28 50	38 25

PHILADELPHIA TIRE BOLTS.

Length.	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	Length.	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$
1	$1 50	$1 85			3	$1 75	$2 00	$2 74	$3 60
1¼	1 50	1 85			3¼	1 80	2 08		
1½	1 50	1 85	$2 24		3½	1 85	2 16	2 90	3 80
1¾	1 50	1 85	2 32		4		2 30	3 06	4 00
2	1 55	1 85	2 41	$3 20	4½			3 22	4 20
2¼	1 60	1 85	2 50	3 30	5			3 38	4 40
2½	1 65	1 85	2 58	3 40	5½				4 60
2¾	1 70	1 92	2 66	3 50	6				4 80

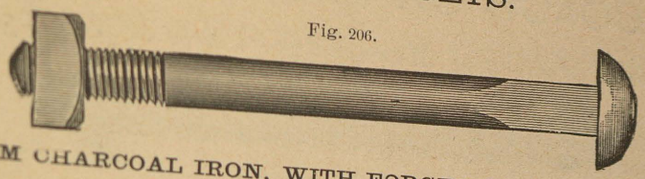
PHILADELPHIA CARRIAGE BOLTS.

WITH FORGED NUTS, TURNED HEADS AND FINISHED POINTS.

Length.	$\frac{3}{16}$ and $\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
1	$2 50	$3 68			
1¼	2 65	3 68			
1½	2 80	3 68	$ 5 00	$ 6 16	$ 7 64
1¾	2 95	3 85	5 00	6 16	7 64
2	3 10	4 03	5 00	6 16	7 64
2¼	3 24	4 20	5 20	6 35	
2½	3 36	4 35	5 40	6 54	8 06
2¾	3 50	4 50	5 58	6 74	
3	3 65	4 68	5 78	6 94	8 48
3¼	3 78	4 84	5 96	7 14	
3½	3 92	5 00	6 16	7 30	8 90
3¾	4 06	5 16	6 36	7 70	
4	4 20	5 30	6 56	7 70	9 34
4¼	4 34	5 50	6 76		
4½	4 48	5 65	6 92	8 08	9 76
4¾	4 75	5 98	7 34	8 46	10 18
5	5 02	6 30	7 70	8 86	10 60
5½	5 30	6 62	8 08	9 24	11 02
6	5 58	6 92	8 44	9 62	11 44
6½	5 85	7 24	8 80	10 10	11 88
7	6 12	7 55	9 16	10 48	12 30
7½		7 88	9 52	10 86	12 72
8		8 00	9 88	11 24	13 14
8½		8 35	10 24	11 62	13 56
9			10 60	12 10	14 00
9½			10 96	12 48	14 42
10				12 86	15 26
11				13 24	16 12
12					

CARRIAGE BOLTS.

Fig. 206.

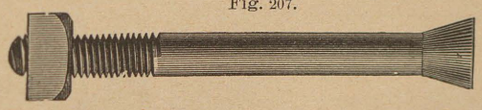


MADE FROM CHARCOAL IRON, WITH FORGED NUTS AND OVAL HEADS.

Manufacturers' Standard List of Common Carriage Bolts, adopted at a Meeting held in New York, February 28th, 1883.

LENGTH.	3/16 and 1/4	5/16	3/8	7/16	1/2	9/16 and 5/8	3/4
1″ to 1½″	$1 00	$1 25	$1 60	$2 32	$2 70	$4 60	$8 00
1½	1 04	1 30	1 60	2 32	2 70	4 60	8 00
2	1 07	1 35	1 60	2 32	2 70	4 60	8 00
2¼	1 11	1 40	1 67	2 40	2 81	4 60	8 00
2½	1 14	1 45	1 73	2 48	2 92	4 60	8 00
2¾	1 18	1 50	1 80	2 56	3 03	4 60	8 00
3	1 21	1 55	1 86	2 64	3 14	4 60	8 00
3¼	1 25	1 60	1 93	2 72	3 25	4 75	8 20
3½	1 28	1 65	1 99	2 80	3 36	4 90	8 40
3¾	1 32	1 70	2 06	2 88	3 47	5 05	8 60
4	1 35	1 75	2 12	2 96	3 58	5 20	8 80
4¼	1 39	1 80	2 19	3 04	3 69	5 35	9 00
4½	1 42	1 85	2 25	3 12	3 80	5 50	9 20
4¾	1 46	1 90	2 32	3 20	3 91	5 65	9 40
5	1 49	1 95	2 38	3 28	4 02	5 80	9 60
5¼	1 53	2 00	2 45	3 36	4 13	5 95	9 80
5½	1 56	2 05	2 51	3 44	4 24	6 10	10 00
5¾	1 60	2 10	2 58	3 52	4 35	6 25	10 20
6	1 63	2 15	2 64	3 60	4 46	6 40	10 40
6¼	1 67	2 20	2 71	3 68	4 57	6 55	10 60
6½	1 70	2 25	2 77	3 76	4 68	6 70	10 80
7	1 77	2 35	2 90	3 92	4 90	7 00	11 20
7½	1 84	2 45	3 03	4 08	5 12	7 30	11 60
8	1 91	2 55	3 16	4 24	5 34	7 60	12 00
8½	.....	2 65	3 29	4 40	5 56	7 90	12 40
9	.....	2 75	3 42	4 56	5 78	8 20	12 80
9½	.....	2 85	3 55	4 72	6 00	8 50	13 20
10	.....	2 95	3 68	4 88	6 22	8 80	13 60
10½	.....	.....	3 81	5 04	6 44	9 10	14 00
11	.....	.....	3 94	5 20	6 66	9 40	14 40
11½	.....	.....	4 07	5 36	6 88	9 70	14 80
12	.....	.....	4 21	5 52	7 10	10 00	15 20

Fig. 207.



TIRE BOLTS.

LENGTH.	3/16	1/4
1	$ 60	$ 80
1¼	60	80
1½	60	80
1¾	65	85
2	70	90
2¼	75	95
2½	80	1 00
2¾	85	1 05
3	90	1 10
3¼	95	1 15
3½	1 00	1 20
3¾	1 05	1 25
4	1 10	1 30

SLEIGH SHOE BOLTS.

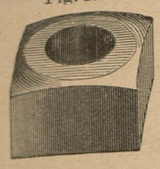
LENGTH.	5/16	3/8	7/16	1/2
2	$1 17	$2 20	$3 60	$4 35
2½	1 31	2 40	3 85	4 65
3	1 45	2 60	4 10	4 95
3½	1 59	2 80	4 35	5 25
4	1 73	3 00	4 60	5 55
4½	1 87	3 20	4 85	5 85
5	2 05	3 40	5 10	6 15
5½	2 15	3 60	5 35	6 45
6	2 29	3 80	5 60	6 75
6½	.....	4 00	5 85	7 05
7	.....	4 20	6 10	7 35
7½	.....	4 40	6 35	7 65
8	.....	4 60	6 60	7 95

MANUFACTURERS' STANDARD LISTS.

HOT PRESSED AND FORGED SQUARE NUTS.

200 POUND KEGS.

Fig. 209.

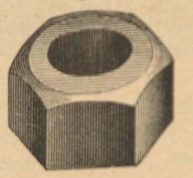


Short Diameter.	Thickness.	Hole.	Size of Bolt.	Price Per Lb.
	$\frac{3}{16}$	$\frac{3}{32}$	$\frac{1}{8}$	50
	$\frac{5}{32}$	$\frac{5}{32}$	$\frac{3}{16}$	30
	$\frac{7}{32}$	$\frac{7}{32}$	$\frac{1}{4}$	20
	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{16}$	17
	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{3}{8}$	15
	$\frac{11}{32}$	$\frac{3}{8}$	$\frac{7}{16}$	$13\frac{1}{2}$
	$\frac{13}{32}$	$\frac{7}{16}$	$\frac{1}{2}$	$13\frac{1}{2}$
	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$12\frac{1}{2}$
	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$12\frac{1}{2}$
1	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$12\frac{1}{2}$
$1\frac{1}{4}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	12
$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	12
$1\frac{1}{4}$	$\frac{21}{32}$	$\frac{3}{4}$	$\frac{7}{8}$	$11\frac{1}{2}$
$1\frac{1}{4}$	$\frac{11}{16}$	$\frac{3}{4}$	1	$11\frac{1}{2}$
$1\frac{1}{4}$	$\frac{23}{32}$	$\frac{7}{8}$	1	$11\frac{1}{2}$
$1\frac{1}{4}$	$\frac{25}{32}$	$\frac{7}{8}$	1	$11\frac{1}{2}$
$1\frac{1}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$11\frac{1}{2}$
2	1	$\frac{7}{8}$	1	$11\frac{1}{2}$
2	1	$\frac{7}{8}$	$1\frac{1}{8}$	$11\frac{1}{2}$
$2\frac{1}{4}$	$1\frac{1}{4}$	$\frac{15}{16}$	$1\frac{1}{4}$	$11\frac{1}{2}$
$2\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$12\frac{1}{2}$
$2\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$12\frac{1}{2}$
$2\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{3}{16}$	$1\frac{3}{8}$	$12\frac{1}{2}$
3	$1\frac{1}{2}$	$1\frac{1}{16}$	$1\frac{1}{2}$	13
$3\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{7}{16}$	$1\frac{5}{8}$	13
$3\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$1\frac{3}{4}$	14
$3\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{11}{16}$	$1\frac{7}{8}$	14
4	2	$1\frac{3}{16}$	2	14

HOT PRESSED HEXAGON NUTS.

200 POUND KEGS.

Fig. 208.

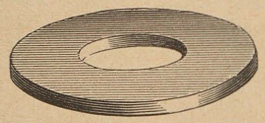


Width.	Thickness.	Hole.	Size of Bolt.	Price Per Lb.
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{32}$	$\frac{1}{4}$	30
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{9}{32}$	$\frac{5}{16}$	25
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{11}{32}$	$\frac{3}{8}$	20
$\frac{7}{8}$	$\frac{7}{16}$	$\frac{13}{32}$	$\frac{7}{16}$	18
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	16
1	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	16
$1\frac{1}{8}$	$\frac{9}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	16
$1\frac{1}{8}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{8}$	15
$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{8}$	15
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{11}{16}$	$\frac{5}{8}$	15
$1\frac{3}{8}$	$\frac{3}{4}$	$\frac{11}{16}$	$\frac{3}{4}$	15
$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{16}$	$\frac{3}{4}$	$14\frac{1}{2}$
$1\frac{1}{2}$	$\frac{7}{8}$	$\frac{13}{16}$	$\frac{3}{4}$	$14\frac{1}{2}$
$1\frac{5}{8}$	$\frac{7}{8}$	$\frac{13}{16}$	$\frac{7}{8}$	$14\frac{1}{2}$
$1\frac{5}{8}$	1	$\frac{13}{16}$	$\frac{7}{8}$	$14\frac{1}{2}$
$1\frac{3}{4}$	1	$\frac{7}{8}$	1	$14\frac{1}{2}$
$1\frac{3}{4}$	$1\frac{1}{8}$	$\frac{7}{8}$	1	$14\frac{1}{2}$
2	$1\frac{1}{4}$	$\frac{15}{16}$	$1\frac{1}{8}$	$14\frac{1}{2}$
$2\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{16}$	$1\frac{1}{4}$	$15\frac{1}{2}$
$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{3}{16}$	$1\frac{3}{8}$	$15\frac{1}{2}$
$2\frac{3}{4}$	$1\frac{5}{8}$	$1\frac{5}{16}$	$1\frac{1}{2}$	$15\frac{1}{2}$
3	$1\frac{3}{4}$	$1\frac{7}{16}$	$1\frac{5}{8}$	16
$3\frac{1}{4}$	$1\frac{7}{8}$	$1\frac{9}{16}$	$1\frac{3}{4}$	16
$3\frac{1}{2}$	2	$1\frac{11}{16}$	$1\frac{7}{8}$	17
$3\frac{1}{2}$	2	$1\frac{13}{16}$	2	17

WASHERS.

200 POUND KEGS.

Fig. 210.



Diameter.	Size of Hole.	Thickness Wire Gauge.	Size of Bolt.	Price per Lb.
$\frac{1}{2}$	$\frac{1}{4}$	No. 18	$\frac{3}{16}$	25
$\frac{5}{8}$	$\frac{5}{16}$	" 16	$\frac{1}{4}$	22
$\frac{3}{4}$	$\frac{5}{16}$	" 16	$\frac{1}{4}$	19
$\frac{7}{8}$	$\frac{3}{8}$	" 16	$\frac{5}{16}$	17
1	$\frac{7}{16}$	" 14	$\frac{3}{8}$	15
$1\frac{1}{8}$	$\frac{1}{2}$	" 14	$\frac{7}{16}$	15
$1\frac{1}{4}$	$\frac{1}{2}$	" 14	$\frac{7}{16}$	15
$1\frac{3}{8}$	$\frac{9}{16}$	" 12	$\frac{1}{2}$	13
$1\frac{1}{2}$	$\frac{5}{8}$	" 12	$\frac{9}{16}$	13
$1\frac{3}{4}$	$\frac{11}{16}$	" 10	$\frac{5}{8}$	$12\frac{1}{2}$
2	$\frac{13}{16}$	" 10	$\frac{3}{4}$	$12\frac{1}{2}$
$2\frac{1}{4}$	$\frac{15}{16}$	" 9	$\frac{7}{8}$	$12\frac{1}{2}$
$2\frac{1}{2}$	$1\frac{1}{16}$	" 9	1	$12\frac{1}{2}$
$2\frac{3}{4}$	$1\frac{1}{4}$	" 9	$1\frac{1}{8}$	$12\frac{1}{2}$
3	$1\frac{3}{8}$	" 9	$1\frac{1}{4}$	$12\frac{1}{2}$
$3\frac{1}{4}$	$1\frac{1}{2}$	" 8	$1\frac{3}{8}$	$12\frac{1}{2}$
$3\frac{3}{4}$	$1\frac{5}{8}$	" 8	$1\frac{1}{2}$	$13\frac{1}{2}$
4	$1\frac{7}{8}$	" 8	$1\frac{3}{4}$	$13\frac{1}{2}$
$4\frac{1}{2}$	$2\frac{1}{8}$	" 8	2	$13\frac{1}{2}$

Riveting Burs, all sizes, in kegs of 200 pounds each, same List Price as $\frac{1}{2}$ by $\frac{1}{4}$ inch Washers.

IRON AND STEEL RAILS, SPIKES, SPLICES, &c.,

FOR LOGGING RAILROADS AND MILL TRAMS.

Fig 211

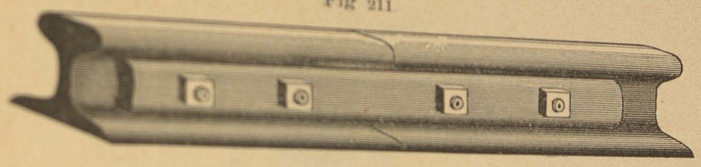


Fig. 212.

T RAILS, 8 lbs. to the yard, per lb., ...
T RAILS, 12, 16, 20, 28, 30 and 40 lbs. to the yard, per lb.,
Long or Short Bars, plain or punched for Spliced Joints.

FLAT RAILS—Punched and Countersunk—

$1\frac{1}{2}$ to $2 \times \frac{1}{4}$ to $\frac{3}{8}$, per lb., ...
$1\frac{1}{2}$ " $\times \frac{7}{16}$ and $\frac{1}{2}$, " .....
$1\frac{1}{4}$ " $\times \frac{5}{8}$ to $\frac{1}{2}$, " .....
$1\frac{1}{4}$ " $\times \frac{1}{4}$ and $\frac{5}{16}$, " .....

SPLICE JOINTS, complete for 12 to 20 lb. Rails, each,
" " " " 28 and 30 lb. " "
" " " " 40 lb. Rails, "

SPLICE BARS—Common Pattern, per lb., ...
" " Angle " " .....

TRACK BOLTS—$3\frac{1}{2}$ and $3\frac{3}{4} \times \frac{3}{4}$—

With Square Nuts, per lb., ...
With Hexagon Nuts, " .....

FROGS AND SWITCHES for Logging Railroads can be furnished at any time.

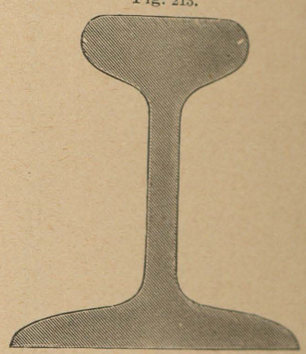
RAILROAD SPIKES—Kegs 150 lbs. each.

$\frac{5}{16} \times 2\frac{1}{2}$, per lb., ...
$\frac{3}{8} \times 2\frac{1}{2}$ to $3\frac{1}{2}$, per lb., ...
$\frac{7}{16} \times 3$ to $4\frac{1}{2}$, per lb., ...
$\frac{1}{2} \times 4$ to 5, per lb., ...
$\frac{9}{16} \times 5\frac{1}{2}$ to 6, per lb., ...
Reversed points $\frac{1}{2}$c. per pound extra.

Countersunk and Chisel Pointed Nails for Flat Rails.

$\frac{1}{4} \times 2\frac{1}{2}$ and 3, per lb., ...
$\frac{5}{16} \times 2\frac{1}{2}$ and 3, per lb., ...

Fig. 213.



POLISHED SHAFTING.

Made by a recently patented process, and is true to size the length of the Bar, Round and Straight. Will not warp in Key-Seating.

Diameter.	*Price per Pound.*	*Weight per Foot.*	*Diameter.*	*Price per Pound.*	*Weight per Foot.*
$\frac{1}{4}$	14	.162	$1\frac{3}{16}$	$6\frac{1}{2}$	8.58
$\frac{5}{16}$	12	.256	$1\frac{7}{8}$		9.15
$\frac{3}{8}$	$11\frac{1}{2}$	.365	$1\frac{15}{16}$		9.82
$\frac{7}{16}$		.510	2		10.45
$\frac{1}{2}$		.652			
$\frac{9}{16}$		.835	$2\frac{1}{16}$	$6\frac{3}{4}$	11.12
$\frac{5}{8}$	10	1.01	$2\frac{1}{8}$		11.80
$\frac{11}{16}$		1.22	$2\frac{3}{16}$		12.53
$\frac{3}{4}$		1.45	$2\frac{1}{4}$		13.24
$\frac{13}{16}$	$9\frac{1}{2}$	1.73	$2\frac{5}{16}$		14.00
$\frac{7}{8}$		2.00	$2\frac{3}{8}$		14.75
$\frac{15}{16}$		2.35	$2\frac{7}{16}$		15.53
$\frac{15}{16}$		2.60	$2\frac{1}{2}$		16.35
1	7	2.95	$2\frac{9}{16}$		17.20
$1\frac{1}{16}$		3.30	$2\frac{5}{8}$		18.00
$1\frac{1}{8}$		3.66	$2\frac{11}{16}$		18.80
$1\frac{3}{16}$		4.08	$2\frac{3}{4}$	7	19.78
$1\frac{1}{4}$	$6\frac{3}{4}$	4.50	$2\frac{13}{16}$		20.70
$1\frac{5}{16}$		4.93	$2\frac{7}{8}$		21.63
$1\frac{3}{8}$		5.40	$2\frac{15}{16}$		22.60
$1\frac{7}{16}$		5.85	3		23.55
$1\frac{1}{2}$		6.38	$3\frac{1}{4}$		27.62
$1\frac{9}{16}$		6.90	$3\frac{1}{2}$		32.65
$1\frac{5}{8}$	$6\frac{1}{2}$	7.40	$3\frac{3}{4}$		36.80
$1\frac{11}{16}$		7.98	4		41.85
$1\frac{3}{4}$					

Lengths less than two feet, $\frac{1}{2}$c. per pound extra. Made to U. S. Standard Gauge, unless otherwise specified. Extreme lengths, 27 feet.

MERCHANT IRON.

STANDARD PRICE LIST ADOPTED FEBRUARY 2d, 1880.

Prices subject to changes of the Market without notice.

FLAT BAR IRON.

	Refined.
1½ to 4 by ⅜ to 1 inch	Adv'ce 1-10
4½ to 6 by ⅜ to 1 inch	" 4–10
1½ to 6 by 1¼ to 1½ inch	" 1–10
1¼ and 1½ by ⅜ to ¾ inch	" 2–10
1 and 1⅛ by ⅜ to ¾ inch	" 4–10
⅛, ¼ and ⅜ by ⅜ to ⅝ inch	" 8–10
7 by ⅜ to 1 inch	" 1
8 by ⅜ to 1 inch	

HEAVY BAND IRON.

7 by ¼ and $\frac{5}{16}$ inch	" 1
1½ to 6 by ¼ and $\frac{5}{16}$ inch	" 2–10
1 to 1⅛ by ¼ and $\frac{5}{16}$ inch	" 3–10
⅛ to ¼ by ¼ and $\frac{5}{16}$ inch	" 5–10
⅛ and ¼ by ¼ and $\frac{5}{16}$ inch	" 1

LIGHT BAND IRON.

1½ to 6 by ⅛ to $\frac{3}{16}$ inch	" 5–10
1½ to 6 by No. 11 and No. 12	" 6–10
1 to 1⅛ by ⅛ to $\frac{3}{16}$ inch	" 6–10
1 to 1⅛ by No. 11 and No. 12	" 7–10
¼ by ⅛ to $\frac{3}{16}$ inch	" 9–10
¼ by No. 11 and No. 12	" 1
⅛ by ⅛ to $\frac{3}{16}$ inch	" 1 2–10
⅛ by No. 11 and No. 12	" 1 3–10
⅛ by ⅛ to $\frac{3}{16}$ inch	" 1 5–10
⅛ by No. 11 and No. 12	" 1 6–10
⅛ by ⅛ to $\frac{3}{16}$ inch	" 1 8–10
⅛ by No. 11 and No. 12	" 1 9–10

WAGON BOX IRON.

⅛ and ¼ inch	" 1 5–10

HOOP IRON.

1½ to 4, Nos. 13 to 15	" 8–10
1½ to 2, Nos. 16 to 18	" 9–10
1 and 1½, Nos. 13 to 15	" 1
1 and 1½, Nos. 16 to 18	" 1 1–10
1 and 1½, Nos. 19 and 20	" 1 2–10
¼ Nos. 13 to 15	" 1 2–10
¼ Nos. 16 to 18	" 1 3–10
¼ Nos. 19 and 20	" 1 4–10
⅛ Nos. 13 to 15	" 1 4–10
⅛ Nos. 16 to 18	" 1 5–10
⅛ Nos. 19 and 20	" 1 6–10
⅜ Nos. 13 to 15	" 1 5–10
⅜ Nos. 16 to 18	" 1 7–10
⅜ Nos. 19 and 20	" 1 8–10
½ Nos. 13 to 15	" 1 7–10
½ Nos. 16 to 18	" 1 9–10
½ Nos. 19 and 20	" 2
⅝ Nos. 13 to 15	" 2
⅝ Nos. 16 to 18	" 2 2–10
⅝ Nos. 19 and 20	" 2 3–10
¾ Nos. 13 to 15	" 2 2–10
¾ Nos. 16 to 18	" 2 4–10
¾ Nos. 19 and 20	" 2 5–10
⅞ Nos. 13 to 15	" 2 5–10
⅞ Nos. 16 to 18	" 2 6–10
⅞ Nos. 19 and 20	" 2 8–10

Hoop Iron $\frac{1}{10}$ cent per lb. extra for each gauge lighter than indicated, and $\frac{1}{10}$ cent for cutting to length.
Cutting ordinary Bars to specific lengths, from $\frac{1}{10}$ to $\frac{3}{10}$ cents per lb., according to length and size.

ROUND AND SQUARE IRON.

	Refined.
1 to 1⅞ inch	Adv'ce 2–10
2 to 2⅝ inch	" 5–10
2¾ to 3¼ inch	" 1
3⅜ to 4 inch	" 1 5–10
4¼ to 4½ inch	" 1 7–10
4¾ to 5 inch	" 2
5¼ to 5½ inch	" 2 3–10
5¾ to 6 inch	" 1–10
¾ to ⅞ inch	" 2–10
⅝ and $\frac{9}{16}$ inch	" 4–10
½ and $\frac{7}{16}$ inch	" 6–10
⅜ inch	" 8–10
$\frac{5}{16}$ inch	" 1
¼ inch	" 3
$\frac{3}{16}$ inch	

OVAL IRON.

⅞ to 1¼ inch	" 4–10
⅝ to ¾ inch	" 6–10
½ inch	" 8–10
⅜ inch	" 1 2–10

HALF OVAL AND HALF ROUND.

1½ to 3 inch	" 1 1–10
⅞ to 1¼ inch	" 7–10
⅝ to ¾ inch	" 1 2–10
½ inch	" 1 5–10
⅜ inch	" 3

HORSE-SHOE IRON.

⅝ to 1¼ by $\frac{5}{16}$ to ⅞ inch	" 1

ANGLES WITH EQUAL LEGS.

Sizes.	Thickness.	Wt. per Foot.	Per lb.
1 by 1	⅛ to $\frac{3}{16}$	0.8 to 1.2	
1⅛ by 1⅛	⅛ to ¼	0.9 to 1.8	
1¼ by 1¼	⅛ to ¼	1.0 to 2.0	
1½ by 1½	$\frac{3}{16}$ to ⅜	1.8 to 3.6	
1¾ by 1¾	$\frac{3}{16}$ to $\frac{7}{16}$	2.1 to 5.0	
2 by 2	¼ to $\frac{7}{16}$	3.1 to 5.6	
2¼ by 2¼	¼ to ½	3.5 to 7.3	
2½ by 2½	$\frac{5}{16}$ to ½	4.9 to 8.0	
2¾ by 2¾	$\frac{5}{16}$ to ½	5.4 to 8.8	
3 by 3	$\frac{5}{16}$ to ⅝	5.9 to 12.2	
3½ by 3½	⅜ to ¾	8.3 to 17.0	
4 by 4	⅜ to ¾	9.5 to 19.5	

ANGLES WITH UNEQUAL LEGS.

3 by 3½	⅜ to ¾	7.7 to 15.8	
3 by 4	⅜ to ¾	8.3 to 17.0	
3½ by 5	⅜ to ¾	10.2 to 20.8	

STEEL.

CRESCENT CAST.

We keep a full line of this celebrated brand of Tool Steel which is so well and favorably known and cannot be excelled.

	Price per Lb.
$\frac{5}{8}$ to 2,	
$\frac{1}{16}$ and $2\frac{1}{8}$ to 3—1 cent advance,	
$\frac{1}{4}$ and $3\frac{1}{8}$ to 6—2 cents advance,	

CANT HOOK.—(Crucible and Hammered.)

For Cant Hooks, Swamp Hooks and Skidding Tongs.

$1\frac{1}{8}$, $1\frac{1}{4}$ and 2 by $\frac{5}{8}$ and $\frac{3}{4}$,	
$\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$ and 2 by $\frac{1}{2}$,	
$\frac{5}{8}$ and 1 by $\frac{7}{16}$,	
$\frac{5}{8}$ and 1 by $\frac{5}{8}$,	

BOOT CALK STEEL.

$\frac{1}{2}$,	
$\frac{9}{16}$,	
$\frac{5}{8}$,	
$\frac{7}{16}$,	

SPRING STEEL.

1 to 3 by $\frac{1}{4}$,	

TIRE STEEL.

$\frac{1}{4}$ and 1 by $\frac{1}{4}$,	
$\frac{1}{4}$ and 1 by $\frac{5}{16}$,	
$\frac{5}{8}$ and $\frac{3}{4}$ by $\frac{1}{4}$,	

SLEIGH SHOE STEEL.

$1\frac{1}{2}$ to 4 by $\frac{1}{2}$,	
$1\frac{1}{2}$ to 4 by $\frac{5}{8}$,	

CUTTER SHOES.

TAPERED AND BENT.

$\frac{1}{4}$ and 1 by $\frac{1}{2}$,	
$\frac{1}{4}$ and 1 by $\frac{5}{8}$,	
$\frac{1}{4}$ and 1 by $\frac{3}{4}$,	
$\frac{1}{2}$ by $\frac{3}{4}$,	

TOE CALK STEEL.

1 by $\frac{1}{2}$,	
$\frac{1}{2}$, $\frac{5}{8}$ and 1 by $\frac{3}{4}$,	

MACHINERY STEEL.

$\frac{5}{8}$ to 2,	
$\frac{1}{16}$ and $2\frac{1}{8}$ to 3—1 cent advance,	
$\frac{1}{4}$ and $3\frac{1}{8}$ to 6—2 cents advance,	

GERMAN STEEL.

$1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$ and 2 by $\frac{1}{2}$ and $\frac{5}{8}$,	

PLOW STEEL.

8 and 9 by $\frac{5}{8}$ and $\frac{1}{2}$,	

COULTER STEEL.

$2\frac{1}{2}$ by $\frac{5}{8}$,	

PIKE STEEL.

$\frac{5}{8}$ and $\frac{1}{2}$,	

BURDEN'S BOILER RIVETS.

$\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and $\frac{7}{8}$ Wire,	
Less than 1 inch long, per lb. extra	

CROW BARS.

Claw, Pinch and Wedge Point,	
Solid Cast Steel,	
Steel Pointed,	

LAKE SUPERIOR REFINED IRON.

Advance 1 cent per pound over same sizes Common Iron.

NORWAY AND SWEDES IRON.

	Per Lb.
Round and Square—1 to 2 inch / Flat—$1\frac{1}{4}$ to 3 inch by $\frac{3}{8}$ to 1 inch	

EXTRA SIZES.

Flat	1 and $1\frac{1}{8}$ by $\frac{3}{8}$ to $\frac{7}{8}$	$\frac{3}{4}$ and $\frac{7}{8}$ by $\frac{1}{2}$ to $\frac{5}{8}$
Extra, per lb.,	$\frac{1}{4}$c.	$\frac{1}{2}$c.
Flat,	$\frac{3}{4}$ to 1 by $\frac{1}{4}$ and $\frac{5}{16}$	
Extra, per lb.,	$1\frac{1}{2}$c.	

Round and Square,	$\frac{3}{4}$ and $\frac{7}{8}$	$\frac{1}{2}$ to $\frac{5}{8}$	$\frac{3}{8}$ and $\frac{7}{16}$	$\frac{1}{4}$ and $\frac{5}{16}$
Extra, per lb.,	$\frac{1}{4}$c.	1c.	$1\frac{1}{4}$c.	$1\frac{1}{2}$c.

Half Round,	$\frac{5}{8}$ to 1	$\frac{1}{2}$	Ovals,	$\frac{5}{8}$ to 1	$\frac{1}{2}$
Extra, per lb.,	$1\frac{1}{2}$c.	$1\frac{3}{4}$c.	Extra, per lb.,	2c.	$2\frac{1}{2}$c.

Half Ovals,	$\frac{3}{4}$ to 1	$\frac{1}{2}$ to $\frac{5}{8}$
Extra, per lb.,	$2\frac{1}{4}$c.	$2\frac{1}{2}$c.

HORSE, SNOW AND MULE SHOES.

	Price per Kg
Perkin's Improved	
Burden's Swaged, medium and heavy	
Mule	
Snow	

HORSE NAILS.

AU SABLE.

Nos.		5	6	7	8	9	10
List	Common	30	27	25	24	23	22
	Finished	31	28	26	25	24	23

Discount per cent.

GLOBE.

Nos.	5	6	7	8	9	10
List	28	25	23	22	21	20

Discount per cent.

SHOER'S FAVORITE.

Nos.	5	6	7	8	9	10
List	28	25	23	22	21	20

Discount per cent.

TOE CALKS.

Sweet's	
Providence, 2 Prong	
Winsted, 1 Prong	

WROUGHT SPIKES.

	Per lb.
$\frac{5}{8}$, $\frac{9}{16}$ and $\frac{1}{2}$ inch by all lengths	
$\frac{3}{8}$, $\frac{7}{16}$ inch " " per lb extra	$\frac{1}{2}$c.
5-16 inch " " " "	$\frac{1}{2}$c.
$\frac{1}{4}$ inch " " " "	$1\frac{1}{2}$c.

CLINCH RINGS.

$\frac{5}{8}$ to 1 3-16 in. hole	

NAILS.

		Per Kg.
Nails, Brads and Fencing	10d to 60d	Advce.
	8d and 9d	$ 25
	6d and 7d	" 50
	4d and 5d	" 75
	3d	" 1 50
	2d	" 2 75
Barrel	¾ in	" 4 00
	⅞ in	" 3 00
	1 in	" 2 50
	1⅛ in	" 1 75
	1¼ in	" 1 50
	1⅜ in	" 1 00
	1½ in	" 75
Finishing	1 in	" 5 00
	1¼ in	" 4 00
	1½ in. and 1¾ in	" 2 00
	2 in	" 1 75
	2½ in	" 1 50
	3 in	" 1 25
Casing and Box	10d to 30d	" 75
	8d	" 1 00
	6d	" 1 25
	4d	" 1 50
	3d	" 2 50
Fine Blued	4d	" 1 75
	3d	" 3 00
	2d	" 3 75
Lining	⅞ in	" 4 50
	¾ in	" 6 00
Clinch	All sizes	" 1 75

BLACK SHEET IRON.

GAUGE.	Boiled.	Elbow and Roofing.	Ch'rcoal Patent Cleaned.	Juniata
No. 10 to 14	3 5-10	.....	5 6-10	7 1-10
" 15 to 17	3 8-10	.....	5 8-10	7 3-10
" 18 to 21	4 1-10	4 6-10	6	7 5-10
" 22 to 24	4 3-10	4 8-10	6 2-10	7 7-10
" 25 and 26	4 5-10	5	6 6-10	8 1-10
" 27	4 7-10	5 2-10	.....	.....
" 28	5 1-10	5 6-10	.....	.....
" 30	5 6 10	.....	.....	.....

Sheets less than 24 inches wide, and No. 18, and lighter, over 30 inches wide, additional charge. Pattern sheets special price.

GALVANIZED SHEET IRON PER POUND.

Nos. 10, 12, 14, 15, 16, 17, 18, 19 and 20	12
" 21, 22, 23 and 24	13
" 25 and 26	14
" 27	15
" 28	16

Additional Prices on Extra Sizes.

No extra charge for lengths or widths on No. 19 and heavier. On No. 20 and lighter, as follows:

Extra Widths.

Less than 24 in. and not less than 22 in wide	½c. lb.
" 22 " " " 20 "	1 "
" 20 " " " 18 "	1½ "
Over 32 inch and not over 36 inch wide	1½ "
" 37 " 44 "	2½ "
All Iron to exact lengths	½ "

WEIGHT OF FLAT ROLLED IRON.

Per Foot.

Breadth in Inches	Thickn'ss in Inches	Weight in Pounds.	Breadth in Inches	Thickn'ss in Inches	Weight in Pounds.	Breadth in Inches	Thickn'ss in Inches	Weight in Pounds.	Breadth in Inches	Thickn'ss in Inches	Weight in Pounds.
¾	⅛	0.316	1⅝	½	2.746	2¾	⅝	5.808	3¾	⅜	4.732
	¼	0.633		⅝	3.432		¾	6.970		½	6.336
	⅜	0.950		¾	4.119		⅞	8.132		⅝	7.921
	½	1.265	1¾	⅛	0.739	1		9.294		¾	9.505
	⅝	1.584		¼	1.479	1⅛		10.455		⅞	11.089
⅞	⅛	0.369		⅜	2.218	1¼		11.617	1		12.673
	¼	0.738		½	2.957	1⅜		12.779	1⅛		14.257
	⅜	1.108		⅝	3.696	1½		13.940	1¼		15.841
	½	1.477		¾	4.435	3	⅛	1.267	1⅜		17.425
	⅝	1.846		⅞	5.178		¼	2.535	1½		19.009
1	¾	2.217	1		5.914		⅜	3.802	4	⅛	1.690
	⅛	0.422	2	⅛	0.845		½	5.069		¼	3.380
	¼	0.845		¼	1.689		⅝	6.337		½	6.759
	⅜	1.267		⅜	2.534		¾	7.604		¾	10.138
	½	1.690		½	3.379		⅞	8.871	1		13.518
	⅝	2.112		⅝	4.224	1		10.138	1¼		16.897
	¾	2.534		¾	5.069	1⅛		11.406	1½		20.277
1⅛	⅛	2.956		⅞	5.914	1¼		12.673	1¾		23.656
	⅛	0.475	1		6.758	1⅜		13.940	2		27.036
	¼	0.950	1⅛		7.604	1½		15.208	4½	¼	3.802
	⅜	1.425	1¼		8.448	3¼	⅛	1.373		½	7.604
	½	1.901	2¼	⅛	0.950		¼	2.746		¾	11.406
	⅝	2.375		¼	1.900		⅜	4.119	1		15.208
	¾	2.850		⅜	2.851		½	5.492	1¼		19.010
1¼	⅛	0.528		½	3.802		⅝	6.865	1½		22.812
	¼	1.056		⅝	4.752		¾	8.237	1¾		26.614
	⅜	1.584		¾	5.703		⅞	9.610	2		30.415
	½	2.112		⅞	6.653	1		10.983	5	¼	4.224
	⅝	2.640	1		7.604	1⅛		12.356		½	8.449
	¾	3.168	1⅛		8.554	1¼		13.730		¾	12.673
1⅜	⅛	0.580	1¼		9.505	1⅜		15.102	1		16.897
	¼	1.161	2½	⅛	1.056	1½		16.475	1¼		21.122
	⅜	1.742		¼	2.112	3½	⅛	1.479	1½		25.346
	½	2.325		⅜	3.168		¼	2.957	1¾		29.570
	⅝	2.904		½	4.224		⅜	4.436	2		33.795
	¾	3.484		⅝	5.280		½	5.914	6	¼	5.070
1½	⅛	0.633		¾	6.336		⅝	7.393		½	10.138
	¼	1.266		⅞	7.392		¾	8.871		¾	15.208
	⅜	1.900	1		8.448		⅞	10.350	1		20.277
	½	2.535	1⅛		9.504	1		11.828	1¼		25.346
	⅝	3.168	1¼		10.560	1⅛		13.307	1½		30.416
	¾	3.802	1⅜		11.616	1¼		14.785	1¾		35.484
	⅞	4.435	1½		12.672	1⅜		16.204	2		40.554
1⅝	1	5.068	2¾	⅛	1.162	1½		17.742			
	⅛	0.686		¼	2.323	3¾	⅛	1.584			
	¼	1 372		⅜	3.485		¼	3.168			
	⅜	2.059		½	4.647						

TABLES OF WEIGHTS OF IRON.

WEIGHT OF SQUARE IRON.
One Foot in Length.

In.	Lbs.	In.	Lbs.	In.	Lbs.	In.	Lbs.
1/4	.21	1 1/8	4.21	2	13.33	3 3/4	46.87
5/16	.32	1 3/16	4.70	2 1/8	15.05	3 7/8	50.05
3/8	.47	1 1/4	5.20	2 1/4	16.87	4	53.33
7/16	.64	1 5/16	5.74	2 3/8	18.80	4 1/8	56.71
1/2	.83	1 3/8	6.30	2 1/2	20.80	4 1/4	60.20
9/16	1.05	1 7/16	6.88	2 5/8	22.96	4 3/8	63.80
5/8	1.30	1 1/2	7.50	2 3/4	25.20	4 1/2	67.50
11/16	1.57	1 9/16	8.15	2 7/8	27.55	4 5/8	71.30
3/4	1.87	1 5/8	8.80	3	30.00	4 3/4	75.20
13/16	2.20	1 11/16	9.50	3 1/8	32.55	4 7/8	79.21
7/8	2.55	1 3/4	10.20	3 1/4	35.20	5	83.33
15/16	2.92	1 13/16	10.69	3 3/8	37.96	5 1/2	101.68
1	3.33	1 7/8	11.71	3 1/2	40.80	6	121.00
1 1/16	3.76	1 15/16	12.52	3 5/8	43.80	7	164.70

WEIGHT OF ROUND ROLLED IRON.
One Foot in Length.

In.	Lbs.	In.	Lbs.	In.	Lbs.	In.	Lbs.
1/4	.16	1 1/8	3.31	2	10.47	3 1/2	36.91
5/16	.26	1 3/16	3.69	2 1/8	11.82	3 5/8	39.33
3/8	.37	1 1/4	4.09	2 1/4	13.25	3 3/4	41.86
7/16	.50	1 5/16	4.51	2 3/8	14.76	3 7/8	44.56
1/2	.65	1 3/8	4.95	2 1/2	16.36	4	47.28
9/16	.83	1 7/16	5.40	2 5/8	18.03	4 1/4	50.13
5/8	1.02	1 1/2	5.89	2 3/4	19.79	4 1/2	53.10
11/16	1.23	1 9/16	6.40	2 7/8	21.63	4 3/4	56.18
3/4	1.47	1 5/8	6.91	3	23.56	4 7/8	59.38
13/16	1.72	1 11/16	7.46	3 1/8	25.56	5	62.71
7/8	2.00	1 3/4	8.01	3 1/4	27.65	5 1/2	79.85
15/16	2.30	1 13/16	8.60	3 3/8	29.82	6	95.03
1	2.61	1 7/8	9.20	3 1/2	32.07	7	129.35
1 1/16	2.95	1 15/16	9.83	3 5/8	34.40		

WEIGHT OF ANGLE IRON.
Per Foot.

Size.	Weight.	Size.	Weight.
1 1/4 in.	1 1/4 to 1 1/2 lbs.	2 1/2 in.	5 to 7 lbs.
1 1/2 "	1 1/2 to 2 lbs.	2 3/4 "	6 1/2 to 8 1/2 lbs.
1 3/4 "	2 to 3 lbs.	3 "	7 1/4 to 9 lbs.
2 "	3 to 4 1/2 lbs.	3 1/2 "	8 1/2 to 12 lbs.
2 1/4 "	4 1/2 to 6 lbs.	4 "	12 to 15 lbs.

WEIGHT OF SHEET IRON.
Per Square Foot.

No. Wire Gauge.	Lbs.	No. Wire Gauge.	Lbs.	No. Wire Gauge.	Lbs.
5	8.74	11	5.	22	1.25
6	8.12	12	4.38	24	1.00
7	7.50	14	3.12	25	.90
8	6.86	16	2.50	26	.80
9	6.24	18	1.84	27	.72
10	5.62	20	1.54		

No. 27	Equal to 1/64	inch.	No. 12	Equal to 7/64	Inch.
" 21	" 1/32	"	" 10	" 1/8	"
" 18	" 3/64	"	" 8	" 11/64	"
" 16	" 1/16	"	" 6	" 9/64	"
" 14	" 5/64	"	" 5	" 7/32	"
" 13	" 3/32	"	" 4	" 1/4	"

YARDS OF IRON WIRE PER BUNDLE.

Gauge.	Yards.	Gauge.	Yards.	Gauge.	Yards.
0	71	7	239	14	1132
1	91	8	286	15	1468
2	105	9	342	16	1954
3	121	10	420	17	2540
4	143	11	529	18	3150
5	170	12	700	19	4085
6	203	13	893	20	4912

BOLTS WITH SQUARE HEADS AND NUTS.
Weight per 100, in lbs.

L'gth	1/4	5-16	3-8	7-16	1-2	9-16	5-8	3-4	7-8	1
1	3 3/4	7	9 1/2	.....	.....	.....	.....	.....	.....	.....
1 1/2	4 1/2	8	10 3/4	15 3/4	23 1/2	31	40	.....	.....	.....
2	5 1/4	9	12 1/4	18	26	34 1/2	44	70	.....	.....
2 1/2	6	10	13 3/4	20	29	37 1/2	48 1/2	76	118	.....
3	6 3/4	11	15 1/2	22 1/4	32	41 1/2	53 1/2	82	126	186
3 1/2	7 1/2	12	17 1/4	24 1/2	35 1/2	45	58	88	134	199
4	8 1/4	13	19	26 1/2	38 1/2	48 1/2	62	95	143	214
4 1/2	.....	14	20 1/2	28 1/2	41	52	66	101	151	223
5	.....	15 1/4	22 1/4	30 1/2	44	55 1/2	71	108	160	232
5 1/2	.....	16 1/4	23 3/4	33	46 1/2	59	76	114	168	243
6	.....	17 1/2	25 1/2	35	49	62 1/2	81	121	176	254
6 1/2	.....	.....	27	37	52	66	86	127	184	265
7	.....	.....	28 1/2	40	55	69 1/2	91	133	192	275
7 1/2	.....	.....	30	42	57 1/2	73	96	139	200	286
8	.....	.....	30 1/2	44	60 1/2	76 1/2	100	155	209	296
9	.....	.....	.....	.....	66	83 1/2	109	158	225	318
10	.....	.....	.....	.....	71 1/2	90 1/2	119	170	242	340
11	.....	.....	.....	.....	77	97 1/2	128	183	258	362
12	.....	.....	.....	.....	82 1/2	104 1/2	138	195	275	384

WEIGHT OF BURDEN'S HORSE AND MULE SHOES.

Horse Shoes.	Light Pattern.	Medium Pattern.	Heavy Pattern.
No. 0, Fore.	12 oz.	17 oz.	19 oz.
" 1, "	14 "	20 "	23 "
" 2, "	17 "	24 "	26 "
" 3, "	20 "	28 "	32 "
" 4, "	24 "	34 "	39 "
" 5, "	29 "	41 "	46 "
" 6, "	36 "	48 "	
" 7, "			
" 0, Hind.	10 "	14 "	15 "
" 1, "	11 "	16 "	18 "
" 2, "	14 "	20 "	23 "
" 3, "	18 "	24 "	27 "
" 4, "	21 "	29 "	32 "
" 5, "	27 "	35 "	38 "
" 6, "	32 "	38 "	
" 7, "			

No. 1 Mule	10 oz.	No. 4 Mule	38
No. 2, "	12 "	No. 5, "	
No. 3, "	15 "		

TABLES OF WEIGHTS.—Continued.

SQUARE STEEL PER FOOT.

¼ .213	⅜ .479	½ .855	⅝ 1.33	¾ 1.91	⅞ 2 61	1 3.40	1⅛ 4.34	In.
1¼ .332	1⅜ 6.44	1½ 7.77	1⅝ 9.00	1¾ 10.34	1⅞ 11.98	2 13.63	2⅛ 15.80	In.
2¼ 17.90	2⅜ 19.17	2½ 21.21	2⅝ 23.41	2¾ 25.70	2⅞ 28.10	3 30.60		In.

ROUND STEEL PER FOOT.

¼ .167	⅜ .376	½ .669	⅝ 1.04	¾ 1.50	⅞ 2.05	1 2.67	1⅛ 3.38	In.
1¼ 4.18	1⅜ 5.06	1½ 6 02	1⅝ 7.07	1¾ 8.20	1⅞ 9.41	2 10.71	2⅛ 12.05	In.
2¼ 16.51	2⅜ 18.05	2½ 16.68	2⅝ 18.39	2¾ 20.18	2⅞ 22.06	3 24.23		In.

FLAT STEEL PER FOOT.

Thick	1	1⅛	1¼	1⅜	1½	1¾	2	2¼	2½	Wide.
¼	.852	.985	1.06	1.17	1.27	1.49	1.70	1.91	2.13	
⅜	1.27	1.43	1.59	1.75	1.91	2.23	2.55	2.87	3.20	
½	1.80	1.91	2.13	2 34	2.55	2.98	3.40	3.83	4.26	
⅝	2 13	2.39	2.66	2.92	3.19	3.72	4.26	4.79	5.12	
¾	2.54	2 86	3.18	3.50	3.82	4.46	5.10	5.74	6.40	
⅞	2.89	3.34	3.72	4.09	4.46	5.21	5.96	6.70	7.46	
1	3.40	3.82	4.26	4.68	5.10	5.96	6.80	7.66	8.52	

STANDARD LENGTHS OF CUT NAILS AND WEIGHTS.

Size.	Length.	No. per lb	Size.	Length.	No. per lb.
3d fine	1⅛ in	770	16d nails	3½ in	33
3d nails	1¼ in	490	20d "	4 in	24
4d "	1½ in	288	30d "	4½ in	18
5d "	1¾ in	200	40d "	5 in	14
6d "	2 in	160	50d "	5½ in	12
7d "	2¼ in	128	60d "	6 in	10
8d "	2½ in	88	6d fence	2 in	80
9d "	2¾ in	72	8d "	2½ in	50
10d "	3 in	60	10d "	3 in	34
12d "	3¼ in	44	12d "	3¼ in	29

Showing the average number of Nuts and Washers of M'frs' Standard Sizes in a Keg or Box.

SQUARE NUTS.				HEXAGON NUTS.			
Width.	Thick-ness.	Hole.	No. in 200 Lbs.	Width.	Thick-ness.	Hole.	No. in 200 Lbs.
⅜	¼	7-32	14,844	½	¼	7-32	17,332
⅜	5-16	9-32	7,880	⅝	5-16	9-32	8,964
⅜	⅜	11-32	4,440	¾	⅜	11-32	5,016
⅜	7-16	13-32	2,732	⅞	7-16	13-32	2,988
½	½	7-16	2,450	⅞	½	7-16	2,674
½	½	7-16	1,816	1	½	7-16	2,160
1⅛	½	½	1,390	1⅛	9-16	½	1,445
1⅛	⅝	9-16	1,173	1⅛	⅝	9-16	1,310
1⅛	⅝	9-16	898	1¼	⅝	9-16	1,081
1⅛	⅝	21-32	662	1¼	¾	9-16	920
1⅛	⅝	21-32	538	1⅜	¾	21-32	752
1⅛	⅞	25-32	392	1½	⅞	21-32	510
1⅛	⅞	25-32	326	1⅝	⅞	25-32	450
1⅛	1	⅞	304	1⅝	1	25-32	428
2	1	⅞	224	1¾	1	⅞	372
2	1½	15-16	214	1¾	1⅛	⅞	336
2¼	1⅜	15-16	152	2	1¼	15-16	211
2¼	1¼	1 1-16	143	2¼	1⅜	1 1-16	159
2⅜	1¼	1 1-16	108	2½	1½	1 3-16	119
2⅜	1⅜	1 3-16	83	2¾	1⅝	1 5-16	88
3	1½	1 5-16	65	3	1¾	1 7-16	69
3¼	1⅝	1 7-16	51	3¼	1⅞	1 9-16	56
3½	1⅝	1 9-16	42	3½	2	1 11-16	44
3¾	1⅞	1 11-16	32	3¾	2	1 13-16	43
4	2	1 13-16	27	4	2	1 13-16	29

WROUGHT SPIKES.

Number to a Keg of 150 Pounds.

Length.	¼ in.	5-16 in.	⅜ in.	7-16 in.	½ in.
3 inch.	2250	.....	.....	.....	.....
3½	1890	1208	.....	.....	.....
4	1650	1135	.....	.....	.....
4½	1464	1064	.....	.....	.....
5	1380	930	742	.....	.....
6	1292	868	570	.....	.....
7	1161	662	482	445	306
8	.....	635	455	384	256
9	.....	573	424	300	240
10	.....	.....	391	270	222
11	.....	.....	.....	249	203
12	.....	.....	.....	236	180

WASHERS.

Diam.	Size of Hole.	Thic's Wire Gaug.	Size of Bolt.	No. in 150 lbs	Diam.	Size of Hole.	Thic's Wire Gaug.	Size of Bolt.	No. in 150 lbs
½	¾	18	3-16	80,000	1¾	11-16	10	⅝	2 500
⅝	5-16	16	¼	34,285	2	13-16	10	¾	1,600
¾	⅜	16	¼	22,000	2¼	15-16	9	⅞	1,300
1	7-16	16	5-16	18,500	2½	1 1-16	9	1	950
1¼	½	14	⅜	10,550	2¾	1¼	9	1⅛	700
1⅜	9-16	14	7-16	7,500	3	1⅜	9	1¼	550
1½	⅝	12	½	4,500	3½	1½	9	1⅜	450
		12	9-16	3,850			9		

BOILER IRON PLATES.

Tank, per lb	.....
C. No. 1, per lb	.....
C. H. No. 1 (Shell) per lb	.....
C. H. No. 1 (Flange), per lb	.....
C. H. No. 1 (Fire Box), per lb	.....
Extra Flange	.....
Solid Fire Box	.....

WEIGHT OF BOILER PLATE IRON.

Per Square Foot.

Inch.	Lbs.	Inch.	Lbs.	Inch.	Lbs.
3-16	7.55	7-16	17.62	¾	30.21
¼	10.07	½	20.14	⅞	35.25
5-16	12.59	9-16	22.66	1	40.28
⅜	15.11	⅝	25.18	.....	.....

Fig. 214.

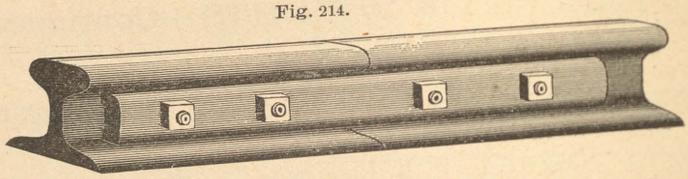


TABLE OF TONS PER MILE REQUIRED OF RAILS.

Weight per yard.	Tons of 2240 lbs. per mile.
16 lbs.	25 tons, 320 lbs.
20 "	31 " 960 "
25 "	39 " 640 "
28 "	44 " 0 "
30 "	47 " 320 "
35 "	55 " 0 "
40 "	63 " 1920 "
45 "	70 " 1600 "
56 "	88 " 0 "
60 "	94 " 640 "

CROSS TIES PER MILE.

Center to center.	No. Ties.
$1\frac{1}{2}$ feet	3,520
$1\frac{3}{4}$ "	3,017
2 "	2,640
$2\frac{1}{4}$ "	2,348
$2\frac{1}{2}$ "	2,113

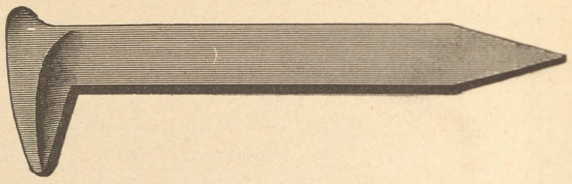
SPLICE JOINTS PER MILE.

Two bars and four bolts and nuts to each joint.

Rails, 20 feet long	528 joints.
" 24 "	440 "
" 26 "	406 "
" 28 "	378 "
" 30 "	352 "

RAILROAD SPIKES.

Fig. 214½.



Size measured under head.	Average number per keg of 200 lbs.	Ties 2 feet between centers, 4 spikes per tie, makes per mile.	Rail used, wt. per yard.
$5\frac{1}{2}$ x $\frac{9}{16}$	360	5870 lbs. $29\frac{1}{3}$ kegs.	45 to 70
5 x $\frac{9}{16}$	400	5170 " 26 — "	40 to 56
5 x $\frac{1}{2}$	450	4660 " $23\frac{1}{3}$ — "	35 to 40
$4\frac{1}{2}$ x $\frac{1}{2}$	530	3960 " 20 — "	28 to 35
4 x $\frac{1}{2}$	600	3520 " $17\frac{2}{3}$ — "	24 to 35
$4\frac{1}{2}$ x $\frac{7}{16}$	680	3110 " $15\frac{1}{3}$ — "	
4 x $\frac{7}{16}$	720	2940 " $14\frac{3}{4}$ — "	20 to 30
$3\frac{1}{2}$ x $\frac{7}{16}$	900	2350 " $11\frac{3}{4}$ — "	
4 x $\frac{3}{8}$	1000	2090 " $10\frac{1}{2}$ — "	16 to 25
$3\frac{1}{2}$ x $\frac{3}{8}$	1190	1780 " 9 — "	
3 x $\frac{3}{8}$	1240	1710 " $8\frac{1}{2}$ — "	16 to 20
$2\frac{1}{2}$ x $\frac{3}{8}$	1342	1575 " $7\frac{7}{8}$ — "	12 to 16

STREET AND TRAM RAIL SPIKES.

Counter-Sunk Heads.

Size.	No. to keg of 150 lbs.	No. to lay one mile, the holes 2 ft. apart.
$2\frac{1}{2}$ x $\frac{1}{4}$	2300	Lbs. 345 = $2\frac{1}{2}$ Kegs.
$2\frac{1}{2}$ x $\frac{5}{16}$	1720	" 565 = $3\frac{3}{4}$ "
3 x $\frac{5}{16}$	1250	" 640 = $4\frac{1}{4}$ "
$3\frac{1}{2}$ x $\frac{5}{16}$	1150	" 690 = $4\frac{3}{5}$ "
5 x $\frac{5}{16}$	900	" 880 = $5\frac{7}{8}$ "
6 x $\frac{5}{16}$	840	" 940 = $6\frac{1}{3}$ "
4 x $\frac{1}{2}$	530	" 1500 = 10 "
$4\frac{1}{2}$ x $\frac{1}{2}$	480	" 1650 = 11 "
6 x $\frac{1}{2}$	360	" 2190 = $14\frac{5}{8}$ "
6 x $\frac{9}{16}$	270	" 2930 = $19\frac{1}{2}$ "

RULES FOR ESTIMATING POWER OF STEAM BOILERS.

First. Shell Boiler. Ten feet of heating surface will produce one-horse power. The heating surface is two-thirds the surface of the cylinder, and is obtained by multiplying the length by two-thirds of the circumference.

Second. Flue Boiler. Twelve feet of heating surface will produce one-horse power. The heating surface is two-thirds the surface of the cylinder; also the entire surface of all the flues.

Third. Tubular Boiler. Fifteen feet of heating surface will produce one-horse power. The heating surface is two-thirds the surface of the cylinder; also the entire surface of all the tubes.

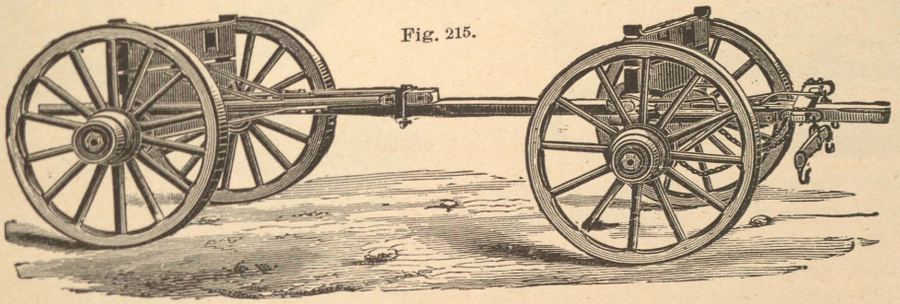
One nominal horse power will require one cubic foot of water per hour. One cubic foot of water contains seven and one-half gallons.

POWER OF STEAM ENGINES.

Cylinder, 7½ x 12 inches,	10-horse power.
Cylinder, 8 x 15 inches,	12-horse power.
Cylinder, 8 x 16 inches,	15-horse power.
Cylinder, 9 x 15 inches,	15-horse power.
Cylinder, 10 x 14 inches,	20-horse power.
Cylinder, 10 x 15 inches,	20-horse power.
Cylinder, 10 x 20 inches,	25-horse power.
Cylinder, 12 x 15 inches,	25-horse power.
Cylinder, 12 x 20 inches,	30-horse power.
Cylinder, 12 x 24 inches,	35-horse power.
Cylinder, 14 x 20 inches,	40-horse power.
Cylinder, 14 x 24 inches,	50-horse power.
Cylinder, 15 x 24 inches,	55-horse power.
Cylinder, 16 x 30 inches,	85-horse power.
Cylinder, 16 x 32 inches,	90-horse power.

LUMBERING TRUCKS.

Fig. 215.

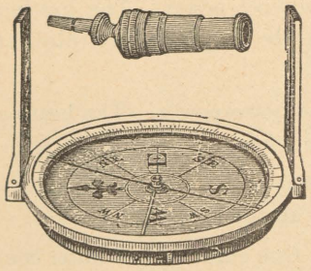


For use in the South, and also for Summer Lumbering in the North. Large heavy Thimble Skeins, Wide Tire, and heavily ironed.

Price, complete, ... $100. 00

COMPASSES.

Fig. 216.



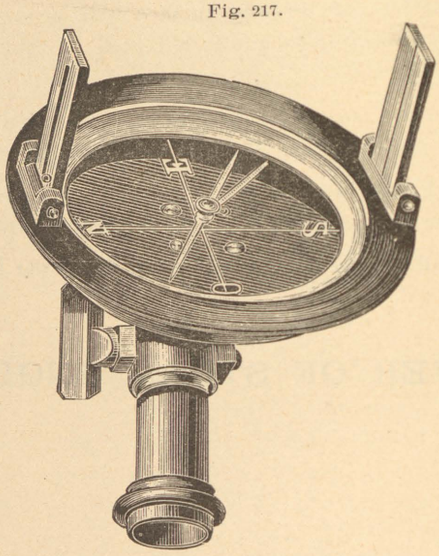
No. 3, Surveyor's Compass, with Sights and Universal Ball Socket for Jacob Staff Brass Case, Metal Dial, Jeweled Cap, Slide Stop, Raised and Full Circle Division, in Polished Mahogany Case.

80 M-M, 3¼ inch Face, Price each, $9.

No. 7, Surveyor's Compass (similar to Fig. 216), with Sights and Universal Ball Sockets and two Levels, Brass Case, Metal Dial, Jeweled Cap, Slide Stop, Raised and Full Circle Division, Leather Case.

90 M-M,	3½	in. Face,	Price each,		$13.50
110 "	4¼	" "	" "		14.50
130 "	5¼	" "	" "		15.00

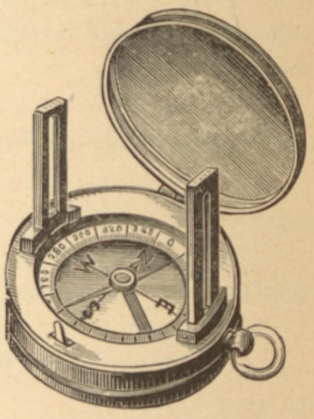
Fig. 217.



No. 13, Surveyor's Sight Compass, Brass Case, Metal Dial, Jeweled Cap, Slide Stop, Raised and Full Circle Division, in Leather Case.

70 M-M,	2¾	inch Face,	Price each,		$5.25
80 "	3¼	" "	" "		5.50

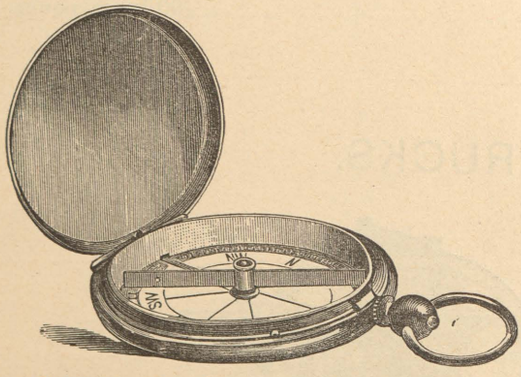
Fig. 218.



No. 18, Surveyor's Sight Compass for locating and running lines, Nickle Plated Case, Hinge Cover, Metal Dial, Jeweled Cap, Slide Stop, Raised and Full Circle Division.

50 M-M,	2	inch Face,	Price each,		$6.00
70 "	2¾	" "	" "		7.50

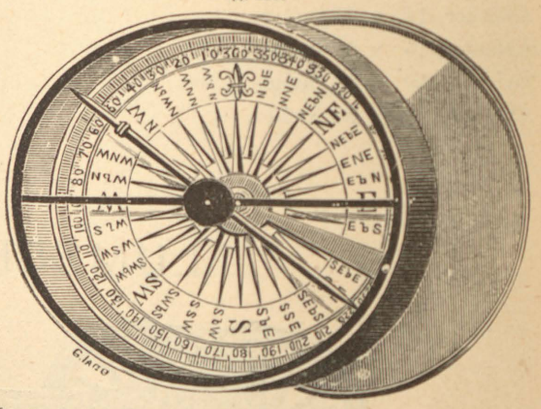
Fig. 219.



No. 57, Nickle Plated Watch Form Hunting Case, Bar Needle, Jeweled Cap, Automatic Stop, Full Circle Division, Metal Dial.

45 M-M,	1¾	inch Face,	Price each,		$3.25
50 "	2	" "	" "		3.75
55 "	2¼	" "	" "		4.50

Fig. 220.



No. 22, Brass Water Proof Case, Bar Needle, Jeweled Cap, Automatic Stop, Full Circle Division, Metal Dial.

45 M-M,	1¾	inch Face,	Price each,		$2 00
50 "	2	" "	" "		2 15
55 "	2¼	" "	" "		2 25
60 "	2½	" "	" "		2 35
70 "	2¾	" "	" "		2 50

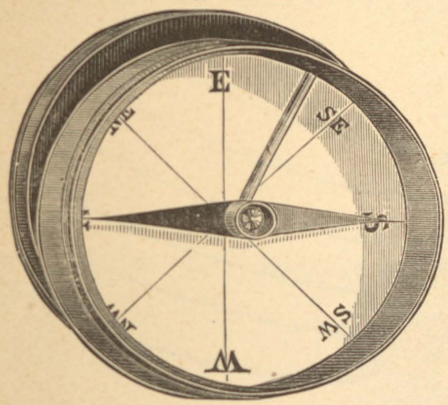
No. 33, Nickle Plated Water Proof Case, Bar Needle, Jeweled Cap, Automatic Stop, Full Circle Division, Metal Dial.

50 M-M,	2	inch Face,	Price each,		$2 65
60 "	2½	" "	" "		2 85
70 "	2¾	" "	" "		3 00

No. 44, Nickle Plated Water Proof Case, Bar Needle, Jeweled Cap, Automatic Stop, Full Circle Division, elaborately engraved Metal Dial.

3 inch, Price each $4 00

Fig. 221.



No. 77, Brass Case, Cover, Metal Dial, Slide Stop, Brass Cap.

40 M-M,	1½	inch	Face,	Price	each,	.....	$ 75
45 "	1¾	"	"	"	"	.....	85
50 "	2	"	"	"	"	.....	90
55 "	2¼	"	"	"	"	.....	1 00
60 "	2⅜	"	"	"	"	.....	1 10

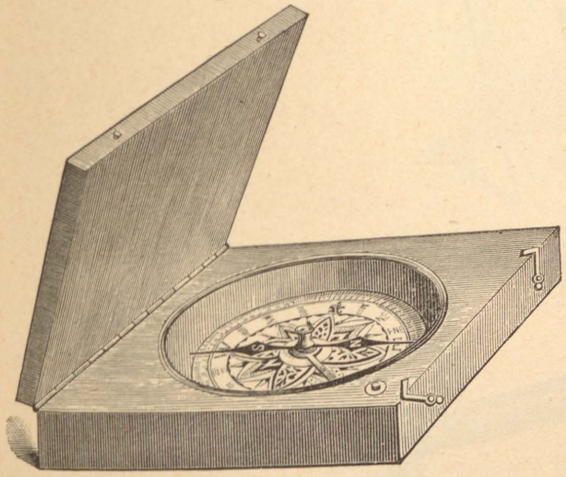
No. 88, Brass Case, Cover, Paper Dial.

1½	inch	Face,	Price	each,	.....	25c.
1¾	"	"	"	"	.....	35c.
2	"	"	"	"	.....	40c.

No. 99, Nickle Plated Case, Cover, Card Dial, Raised and Full Circle Division, Brass Cap.

35 M-M,	1⅜	inch	Face,	Price	each,	.....	40c.
40 "	1½	"	"	"	"	.....	50c.
45 "	1¾	"	"	"	"	.....	60c.

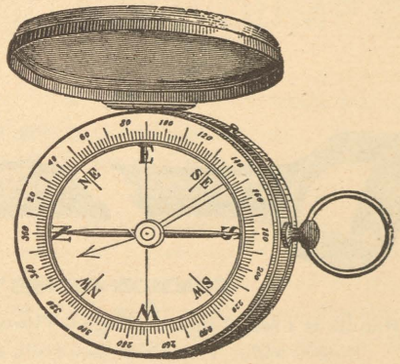
Fig. 223.



No. 202, Mahogany Case (Square) Card Dial, Full Division, Automatic Stop.

2½ inch, Price each, ... 75c.

Fig. 222.



No. 66, Brass Case, Hinge Cover, Metal Dial, Jeweled Cap, Slide Stop, Full Circle Division.

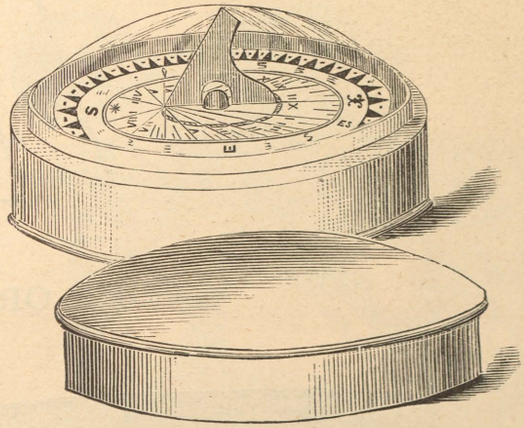
40 M-M,	1½	inch	Face,	Price	each,	.....	$1 25
45 "	1¾	"	"	"	"	.....	1 35
50 "	2	"	"	"	"	.....	1 50
55 "	2¼	"	"	"	"	.....	1 65
60 "	2⅜	"	"	"	"	.....	1 75

No. 101, Luminous Dial, Brass Case, (similar to figure 222), Hinge Cover, Jeweled Cap, Slide Stop.

50 M-M, 2 inch Face, Price each, ... $2 00

The Luminous Dial Compass enables the woodsman to read the instrument in the darkest night, without any artificial light, it being coated by phosphorescent paint.

Fig. 224.

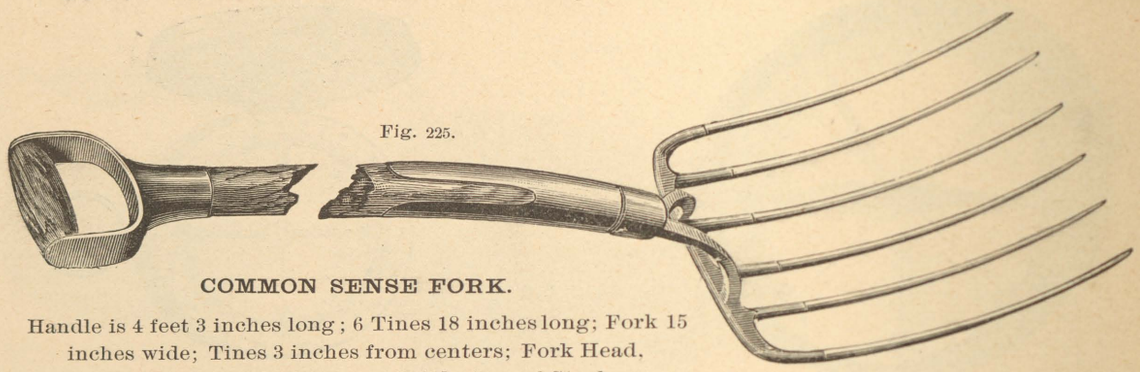


No. 303, Sundial Compass, (Pocket), Wood Case, a very useful and accurate instrument for taking the time of day.

2⅛ inch Diameter, Price each, ... 50c.

SAW DUST FORKS FOR SHINGLE MILLS.

Fig. 225.

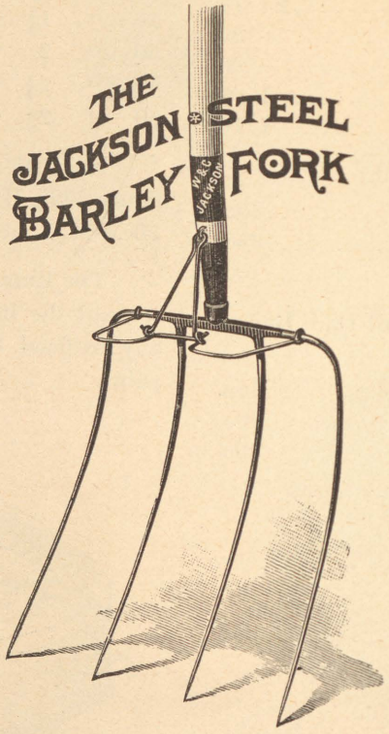


COMMON SENSE FORK.

Handle is 4 feet 3 inches long; 6 Tines 18 inches long; Fork 15 inches wide; Tines 3 inches from centers; Fork Head, Tines and Shanks from one Solid piece of Steel.

We have had this Fork made after consulting with some of our most extensive Shingle Manufacturers. It supplies a want long felt. Price, each, $2.00.

Fig 226.

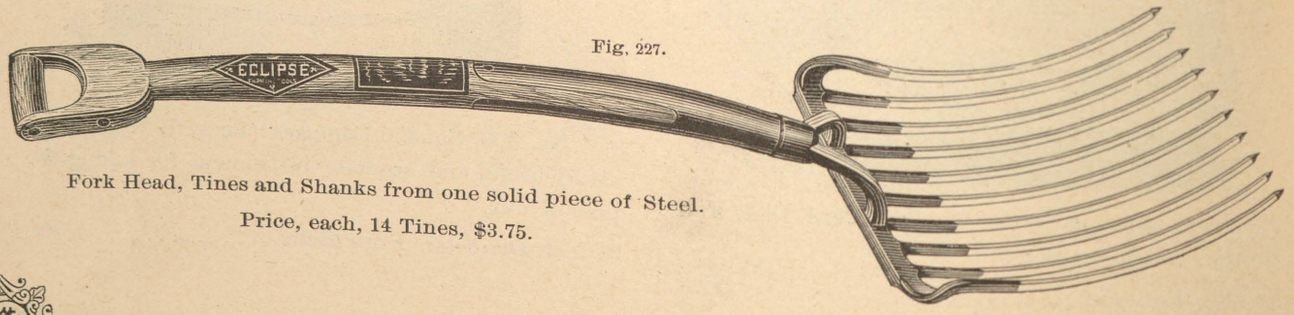


Cut No. 226 represents the JACKSON BARLEY FORK, which is sometimes used for handling Shingle Sawdust.

Handle is 5 feet long, but is without D at end. The four Tines are 18 inches long. Fork is 12 inches wide. Price, each, $1.50.

COKE OR BARK FORKS.

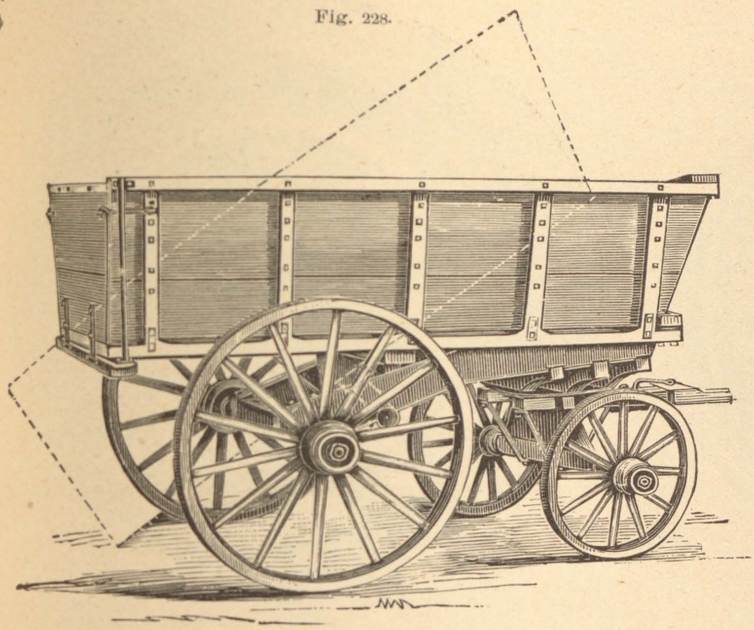
Fig. 227.



Fork Head, Tines and Shanks from one solid piece of Steel.
Price, each, 14 Tines, $3.75.

BENJAMIN'S PAT. SAW DUST AND SLAB DUMP CART.

Fig. 228.



This cart is made of white oak stock, very strongly ironed and braced. Hind wheels are 4 feet 6 inches diameter, with 4 inch tire and 4 in. skein. Front wheels are 2 feet 10 inches, with $2\frac{1}{2}$ inch tire and $3\frac{1}{2}$ inch skein. The box is hung 18 inches in front of the hind axle, which brings about one-third of the load on front axle, making at least one-third lighter draft than the old style cart, so that much larger loads may be drawn.

Box dumps on heavy hard maple rollers, hung to reaches 14 in. below bottom of box which in dumping throws it backward over hind axle, the end striking the ground (*as shown by dotted lines*). The reaches (upon which the whole load rests), are 3x6 in. and are ironed with $3x\frac{1}{2}$ in. iron on bottom, and $3x\frac{3}{8}$ in. on top. When dumped the end of box strikes the ground and stands at an angle of 45°. The end board lifts out and is held by hooks at top. We claim the following for the cart:

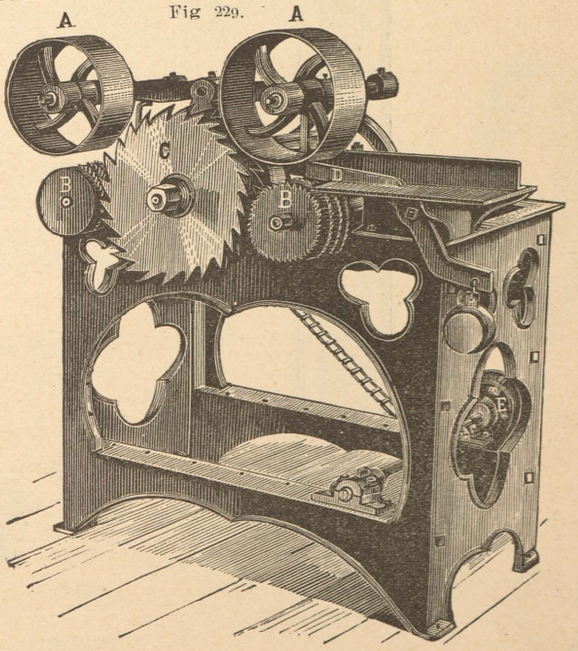
1st. It brings one-third of load on front wheels.
2d. It will draw a load $\frac{1}{3}$ easier than any other cart.
3d. It will dump as easily as any other cart made.
4th. It can carry a larger load than any other cart.
5th. It costs but little more than the common cart.

Price, 2-horse cart..... $ 100 00 One horse cart..... $ 80 00

BRADY'S IMPROVED LATH BOLTER AND LATH AND PICKET MILL.

IRON FRAME.

Fig 229.



This cut represents the bolter which has capacity for easily bolting all the stuff that can be brought to it. To cut lath, take off the 14 in. bolting saws and $1\frac{1}{2}$ in. collars between same and put on from 2 to 8—10 in. lath saws, according to size of machine, separated by $\frac{1}{2}$ in. collars and shift feed rolls closer to saws. Presssure rolls AA are 10 in. diameter and hung in self-adjusting arms so as to pass through different thicknesses of stock from $\frac{1}{4}$ to 6 in. in width. The feed rolls BB on bolter are $6\frac{1}{2}$ in. diam., are run by an endless chain by shaft from pulley E, independent of arbor running saws, so that the machine cannot be choked up. Gauge D is held in position by weight, and if desirable to cut wide stock, it can be run over the gauge which is hung by pivot in center. We have these machines made in different sizes.

Complete, with 2 saws,	capacity	40	M.	daily.....	$ 200 00
" " 4 "	"	60	"	.....	225 00
" " 8 "	"	80	"	.....	250 00

The machines that are now being made have solid feed rolls made of cast steel and fluted with spurs like saw teeth, thus giving a positive feed.

By adjusting collars between saws the machine can make flat or square pickets or bed slats.

STEAM AND WATER GAUGES.

Fig. 230.

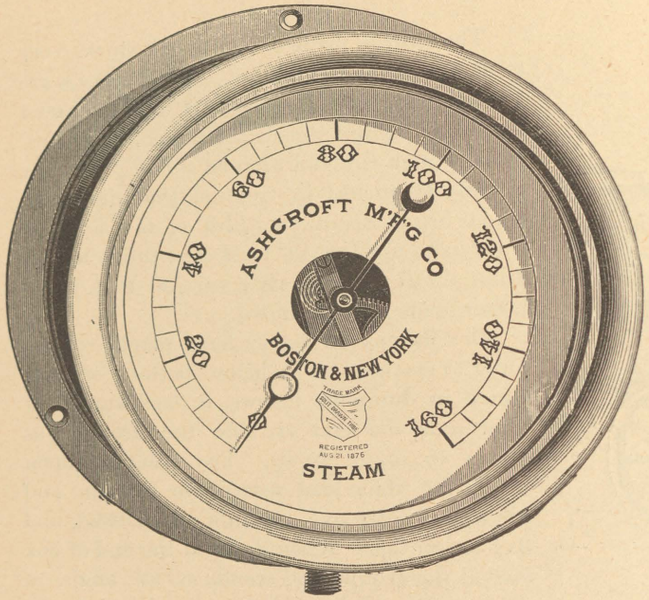
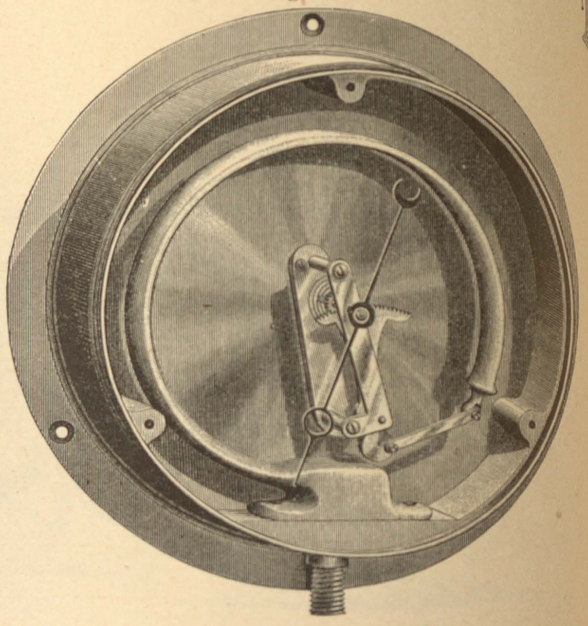


Fig. 231.

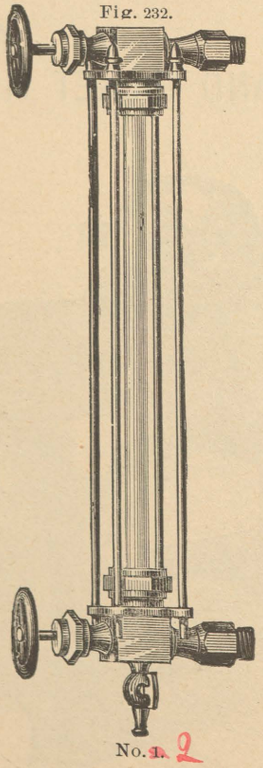


No. 7 Brass Case, 5½ inch Dial, Price.....$6 00
No. 7 Iron " 5½ " " " 5 00

No. 9½ Brass Case, 4½ inch Dial, Price.....$6 85
No. 9½ Iron " 4½ " " " 5 85

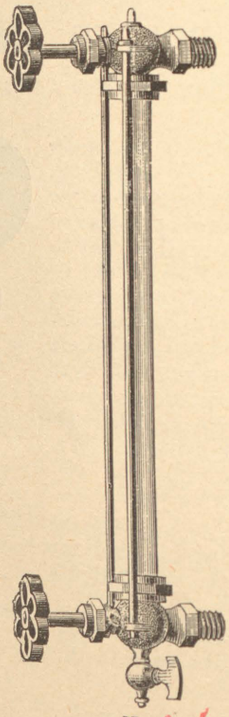
WATER GAUGES.

Fig. 232.



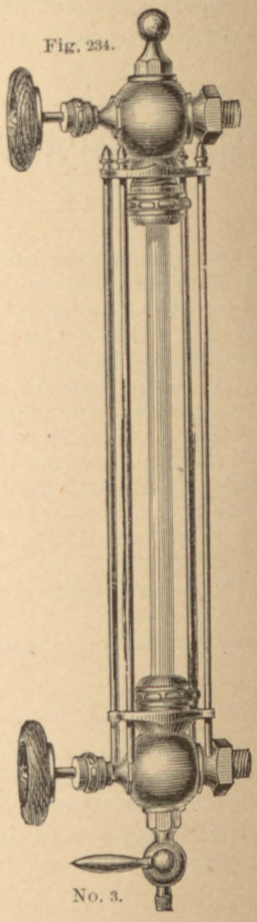
No. 1. 2

Fig. 233.



No. 2. 1

Fig. 234.



No. 3.

COMPLETE.

Price—No. 1, Rough, $2.75; No. 2, Finished, $4.00; No. 3, Finished, $5.00.

SCOTCH GLASS TUBES, FOR WATER GAUGES.

Length, inches.....	10	11	12	13	14	15	16	17	18	19	20	22	24	30	36	48
$\frac{5}{8}$ inch diameter, each..	.45	.45	.45	.45	.50	.55	.60	.65	.70	.70	.80	.90	1.00	....	....	....
$\frac{3}{4}$ " " " ..	.55	.55	.55	.65	.65	.65	.65	.70	.75	.80	.85	.95	1.05	1.50	2.00	3.00

Rubber Washers for same 15 cents per dozen, net.

GLOBE OIL CUPS AND LUBRICATORS.

Fig. 235.

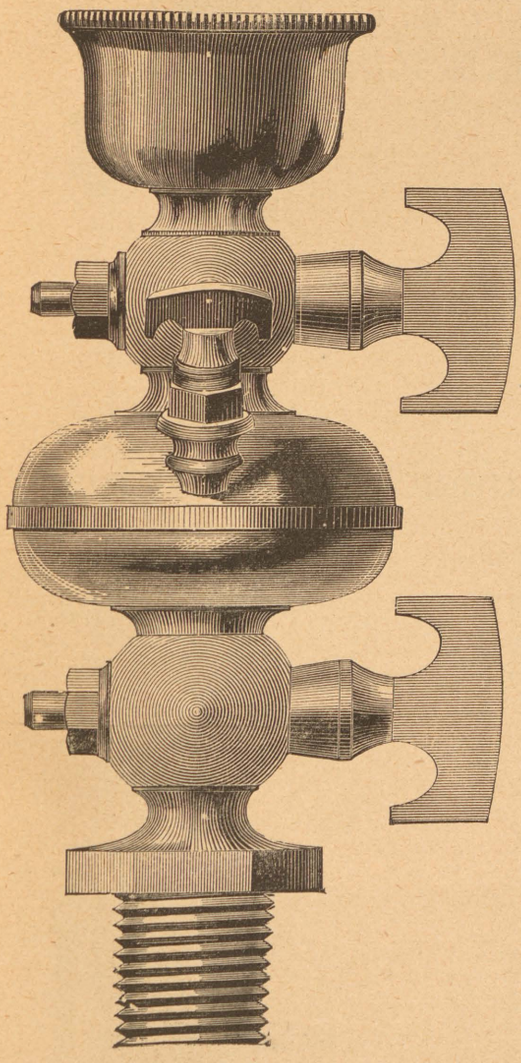
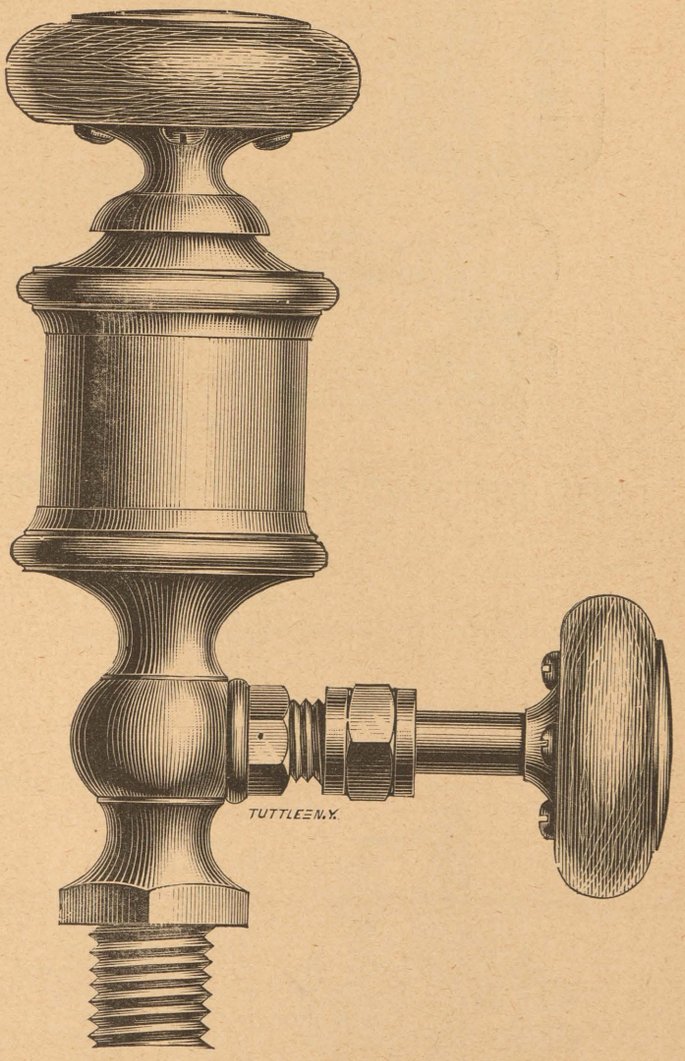


Fig. 236.



GLOBE OIL CUPS.

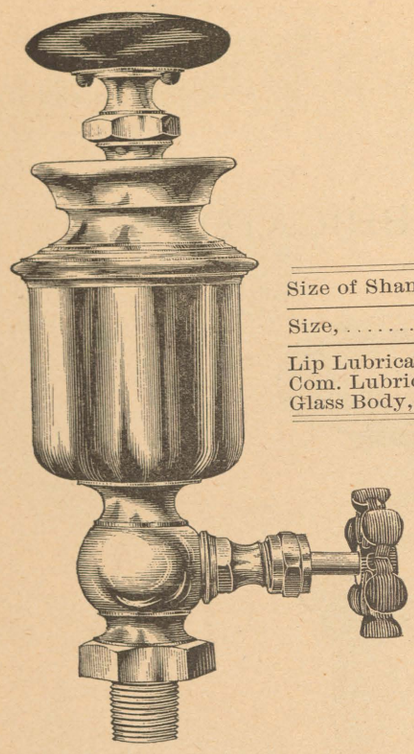
Number..	00	0	1	2	3	4	5
Price....	3.00	3.75	4.50	5.25	6.00	7.50	12.00

COMMON LUBRICATORS.

Number.....	1	2	3	4	5	6	7	8	9	10
Diameter, inch....	1	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{2}$	3
Price.....	1.60	1.85	2.00	2.10	2.35	2.65	2.85	3.00	3.50	4.25

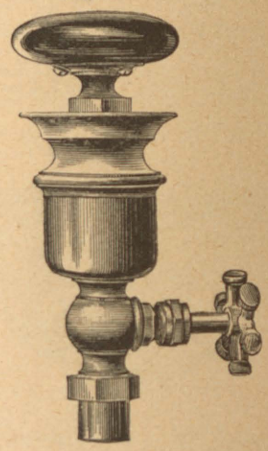
LUBRICATORS.

Fig. 237.



Size of Shank Pipe,	¼	⅜	⅜	⅜	½	½	½
Size,	1	1¼	1½	1¾	2	2½	3
Lip Lubricators,				2 40	3 00	4 00	5 75
Com. Lubricators,	1 60	1 85	2 10	2 35	2 65	3 50	4 25
Glass Body,							

Fig. 238.

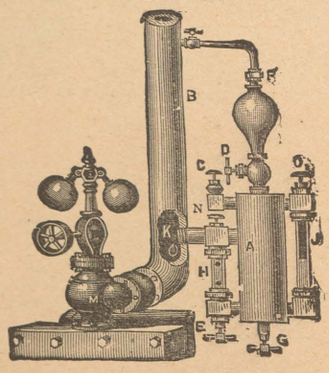


THE DETROIT CONTINUOUS FEED LUBRICATING OIL CUPS.

PRICE LIST.

Size.	*Plain Brass.*	*Nickel Plated.*	*Suitable for Engine with Diameter of Cylinder as follows:*
Half Pint,	$22 00	$25 00	Up to 10 inches.
Pint,	30 00	35 00	10 to 18 inches.
Quart,	45 00	50 00	18 to 30 inches.
Half Gallon,	60 00	65 00	30 and over.
Gallon,	75 00	80 00	

Fig. 239.

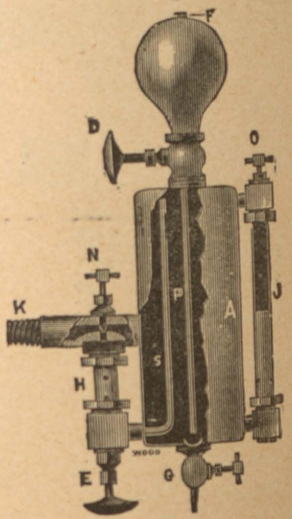


DESCRIPTION.

Fig. 239.

A. Oil Reservoir.
B. Steam Pipe.
C. Oil Filler.
D. Water and Feed Valve.
E. Valve to Regulate flow of Oil.
F. Steam Tube and Condensing Chamber.
G. Valve to draw off water, to prevent freezing, etc.
H. Visible Feed Water Chamber.
J. Glass Indicator.
K. Oil Discharge Pipe,
M. Governor Valve.
N. Valve to correct Pulsation or Unsteadiness in Feed.
O. Vent to be opened when filling Cup.

Fig. 240.



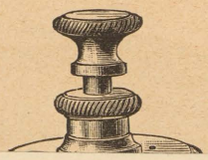
Sectional View of Cup.

OIL CUPS.

Fig. 241.

Fig. 242.

Fig. 243.



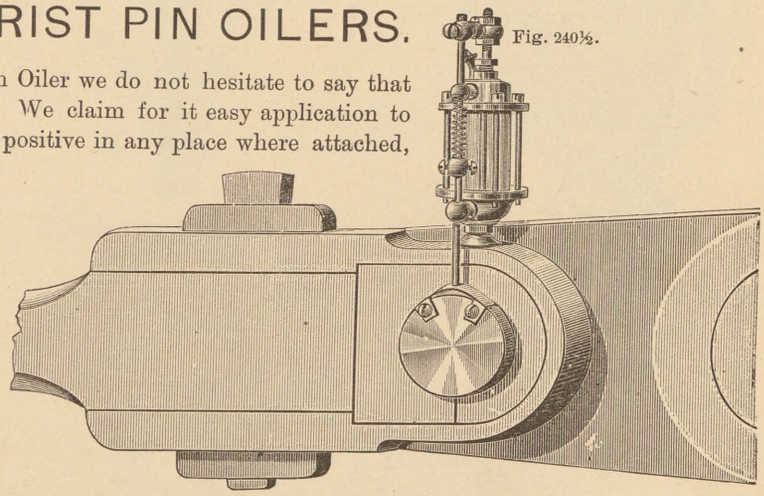
Please paste opposite Page 82 of our Catalogue. [82A

JEWELL'S PATENT WRIST PIN OILERS.

Fig. 240½.

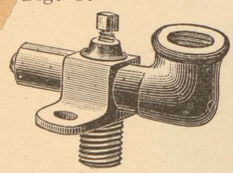
In presenting Jewell's Automatic Wrist Pin Oiler we do not hesitate to say that it is the most perfect automatic oiler known. We claim for it easy application to any style or make of engines; that it is simply positive in any place where attached, effecting a saving of from 50 to 75 per cent. of the oil used by any oiler heretofore placed on the market. That it is impossible for a *bearing to heat or wear where it is used*, as the oil is forced in regular quantities at regular intervals to the part or point required. They can be adjusted in a moment to feed fast or slow, and the uniformity of feed is equally positive in either case.

They are made of the very best brass metal, [illegible] the outer surface nicely finished, before [illegible]g nickel plated.



OILER ATTACHED TO CRANK-PIN.

Fig. 1.



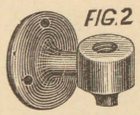


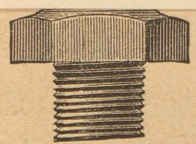
Figure 1 represents an adjustable offset used in attaching Oiler to Pillow Blocks and wide Bearings. Adjust the offset to suit the bearing, then set the screw down securely with wrench. Then drill hole up through sleeve to make outlet for oil to flow to Bearing.

Figure 2 represents a Bracket used in attaching Oiler to an Upright Engine.

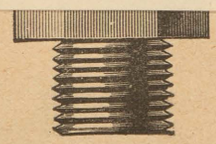
PRICES.

No. 0, ⅓ Pint, $9; No. 1, ½ Pint, $12; No. 2, 1 Pint, $15; Fig. 1, Offset, $2; Fig. 2, Bracket, $1.25. All Nickel Plated.

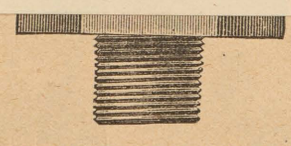
Note.—The No. 0 or ⅓ Pint is made extra strong for fast running engines.



HINGED LID OIL CUPS.



PLAIN OIL CUPS.

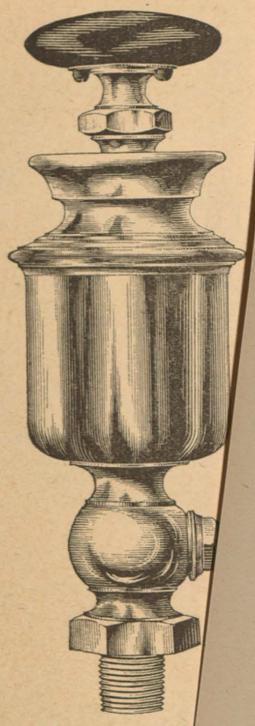


HINGED LID OIL CUPS.
Locomotive Pattern.

Diameter of Cup,	⅞	1	1⅛	1¼	1½	1¾	2	2¼	2½
Will chase (Iron Pipe Size),	⅛	¼	¼	¼	⅜	⅜	⅜	½	½
Price, Plain, Figure 245,	$ 33	$ 38	$ 44	$ 56	$ 75	$ 95	$1 20	$1 60	$2 10
" Hinged Lid, Figure 244,	60	75	1 10	1 25	1 50	2 00	2 60	....	....
" " " " 246,	60	75	1 10	1 25	1 50	2 00	2 60	....	....

LUBRICATORS.

Fig. 237.

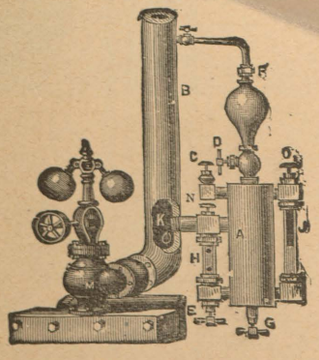


THE DETR

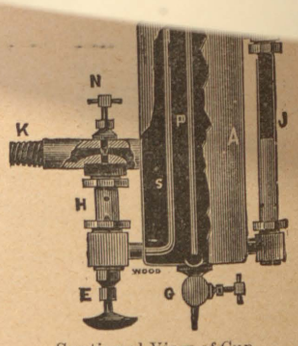
Size.

Half Pint, ...
Pint, ...
Quart, ...
Half Gallon, ...
Gallon, ...

Fig. 239.



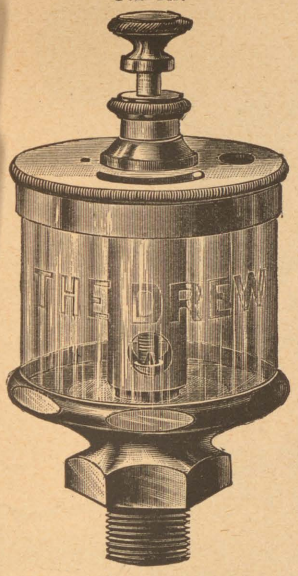
A. Oil Reservoir.
B. Steam Pipe.
C. Oil Filler.
D. Water and Feed Valve.
E. Valve to Regulate flow of Oil.
F. Steam Tube and Condensing Chamber.
G. Valve to draw off water, to prevent freezing, etc.
H. Visible Feed Water Chamber.
J. Glass Indicator.
K. Oil Discharge Pipe,
M. Governor Valve.
N. Valve to correct Pulsation or Unsteadiness in Feed.
O. Vent to be opened when filling Cup.



Sectional View of Cup.

OIL CUPS.

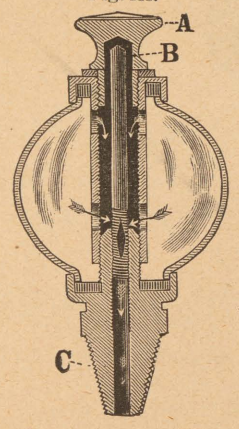
Fig. 241.



ENGINE OILERS.
Straight Pattern.

No. 0, Engine, 1¼ inch Glass, Figure 241,	$ 1 00
No. 1, " 1¼ " " " " "	1 75
No. 2, " 1⅝ " " " " "	3 00
No. 3, " 2¼ " " " " "	4 00
No. 4, Locomotive, 2 inch Glass, Figure 241,	4 50
No. 5, Extra Engine, 3 inch Glass, " "	12 50

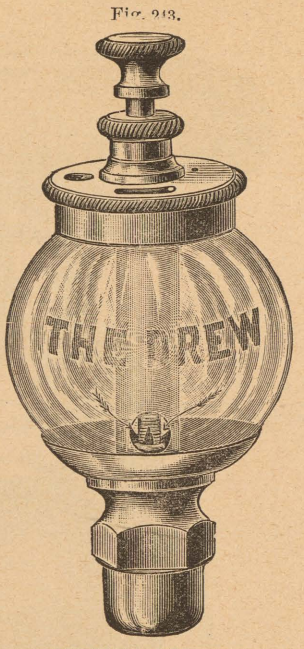
Fig. 242.



SHAFTING OILERS.
Globe Pattern.

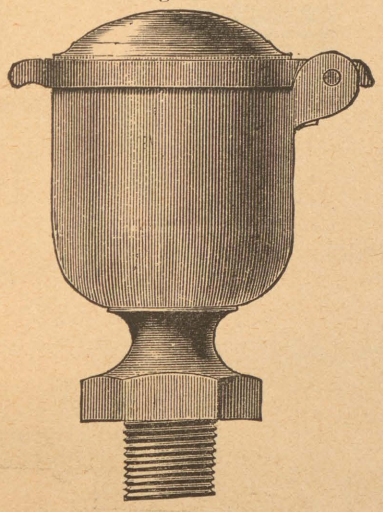
No. 1, For Loose Pulleys, 1¼ inch Globe, Figure 242,	$1 00
No. 2, " Shafting, 2¼ " " " " "	1 35
No. 3, " " 3 " " " " "	2 00
No. 2, Engine, 2¼ inch Globe, Figure 243,	2 00
No. 3, " 3 " " " " "	3 00
No. 4, " 4 " " " " "	4 50

Fig. 243.



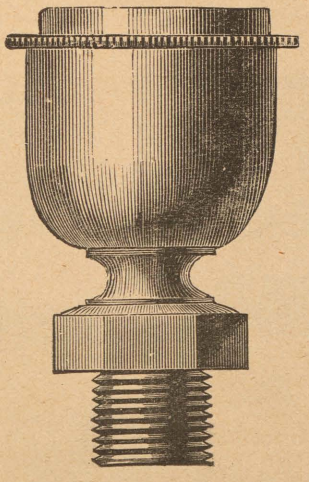
ENGINE OILERS.
Globe Pattern.

Fig. 244.



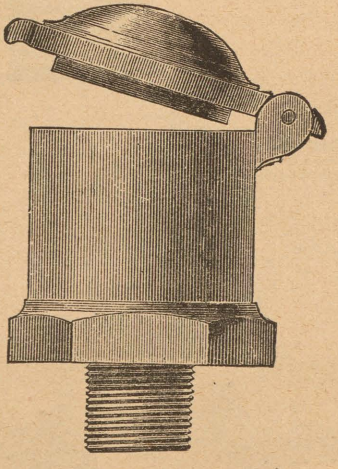
HINGED LID OIL CUPS.

Fig. 245.



PLAIN OIL CUPS.

Fig. 246.



HINGED LID OIL CUPS.
Locomotive Pattern.

Diameter of Cup,	⅞	1	1⅛	1¼	1½	1¾	2	2¼	2½
Will chase (Iron Pipe Size),	⅛	¼	¼	¼	⅜	⅜	⅜	½	½
Price, Plain, Figure 245,	$ 33	$ 38	$ 44	$ 56	$ 75	$ 95	$1 20	$1 60	$2 10
" Hinged Lid, Figure 244,	60	75	1 10	1 25	1 50	2 00	2 60	....	....
" " " " 246,	60	75	1 10	1 25	1 50	2 00	2 60	....	....

GAUGE COCKS—WOOD HANDLE.

Fig. 247.

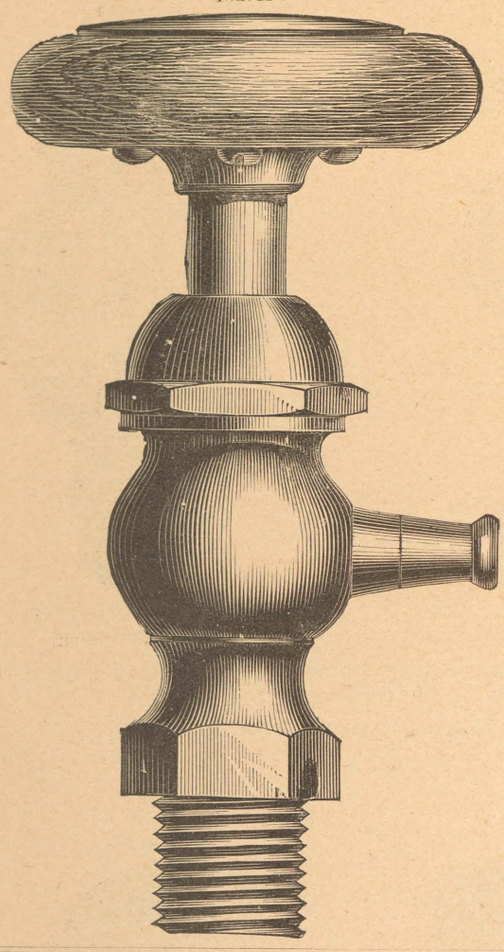
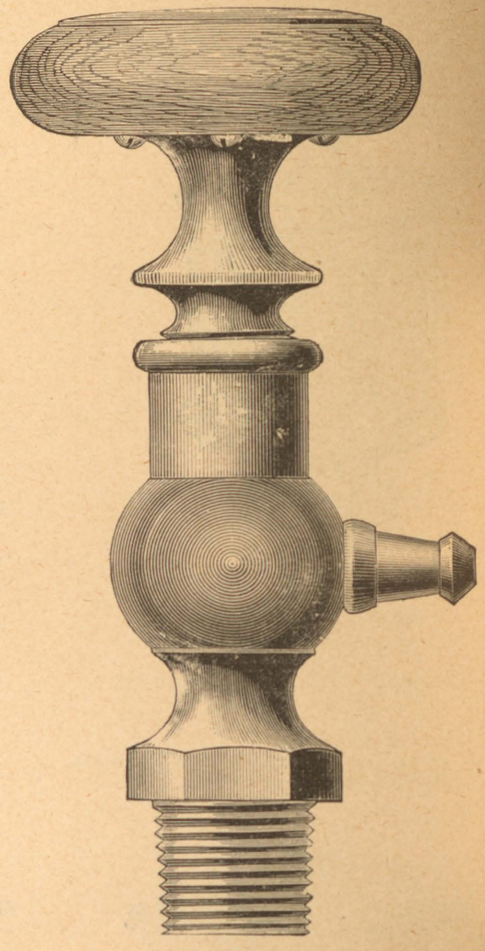


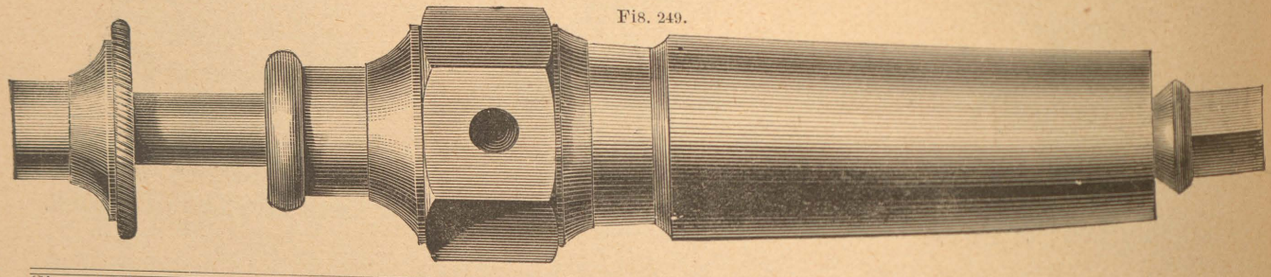
Fig. 248.



S ze	⅜	½	¾
Common	1 10	1 25	1 50
Compression	1 10	1 50	1 75

MISSISSIPPI GAUGE COCKS.

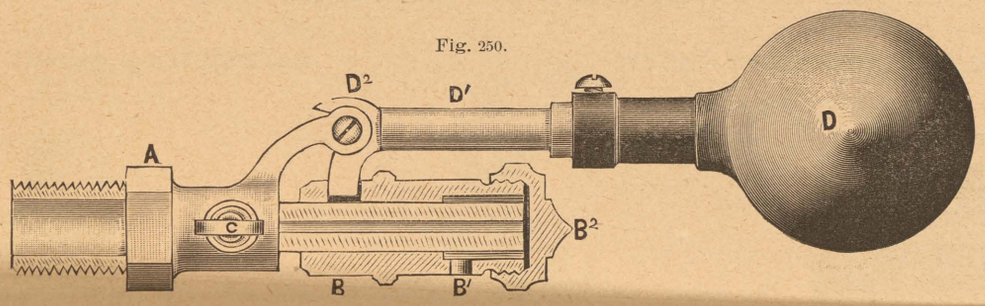
Fis. 249.



Size of Shank	½	⅝	¾	⅞	1	1⅛	1¼
Plain or Threaded	70	80	85	1 15	1 50	1 75	2 50
With Spring	80	90	1 00	1 35	1 75	2 20	3 00

MONTGOMERY'S PATENT GAUGE COCKS.

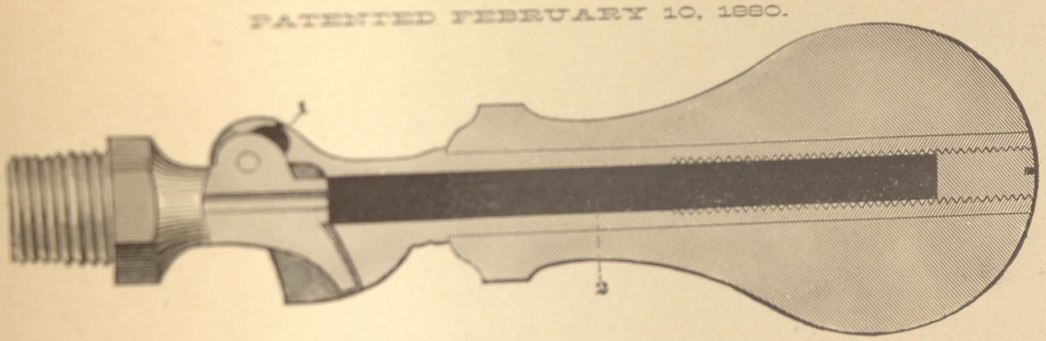
Fig. 250.



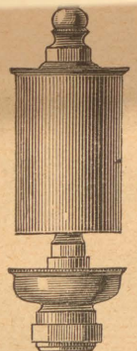
Size of Shank

FELTHOUSEN'S IMPROVED BALL GAUGE COCK.

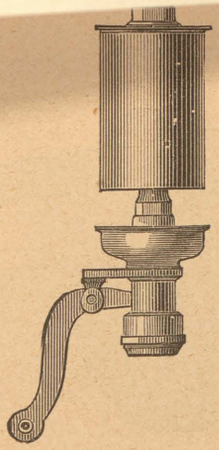
PATENTED FEBRUARY 10, 1880.



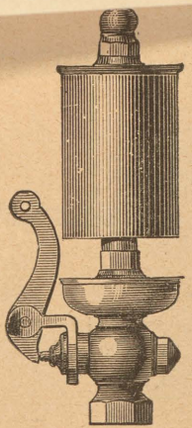
The most perfect Gauge Cock in the market. Each Gauge Cock has four inches of Jenkin's Improved Packing, tested to resist the action of steam at 180 pounds pressure. One Packing, with proper care, will last five years. Price, $1.50.



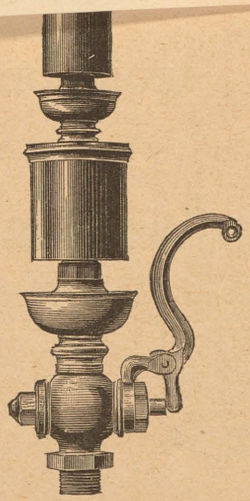
No. 1.



No. 2.



No. 3.



Diameter of Bell,	1	1½	2	2½	3	3½	4	5	6	8	10
Screwed for Pipe,	½	½	½	¾	1	1	1¼	1½	2	2½	2½
No. 1, without Valve,	$1 70	$2 50	$3 00	$4 00	$5 50	$ 7 75	$10 00	$16 00	$22 00	$50 00	$ 80 00
" 2, Stationary Lever,	....	4 00	4 25	5 50	7 00	9 50	12 00	19 00	25 00	.....	.....
" 3, Adjustable Lever,	....	4 60	5 00	6 25	8 00	10 50	13 50	21 00	27 00	70 00	130 00

Patent Chimes, 2 inch and 3 inch, ... $12 00

" " 2 inch, 3 inch and 4 inch (larger sizes to order) 22 00

GAUGE COCKS—WOOD HANDLE.

Fig. 247.

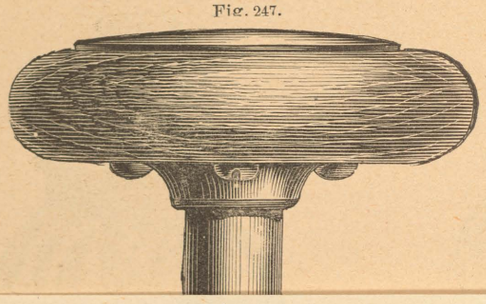
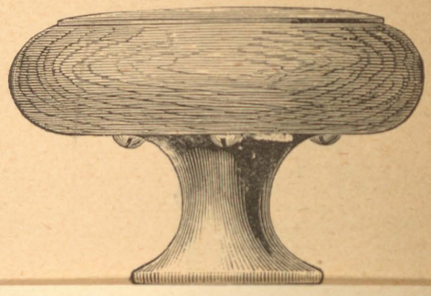


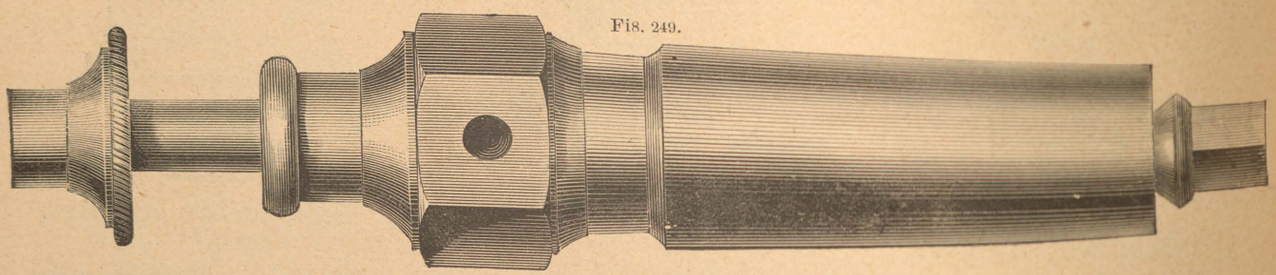
Fig. 248.



Size	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Common	1 10	1 25	1 50
Compression	1 10	1 50	1 75

MISSISSIPPI GAUGE COCKS.

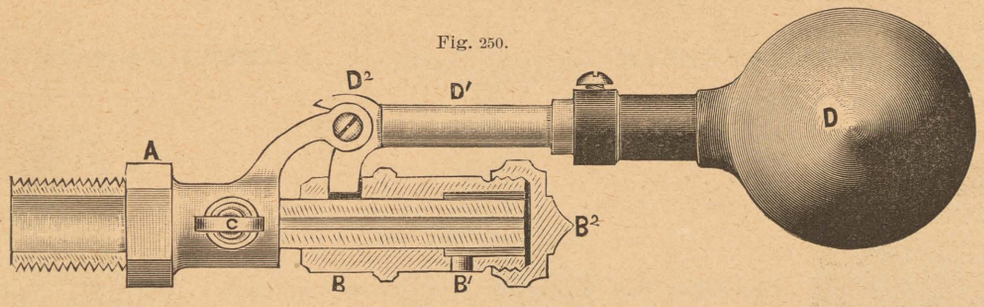
Fig. 249.



Size of Shank	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Plain or Threaded	70	80	85	1 15	1 50	1 75	2 50
With Spring	80	90	1 00	1 35	1 75	2 20	3 00

MONTGOMERY'S PATENT GAUGE COCKS.

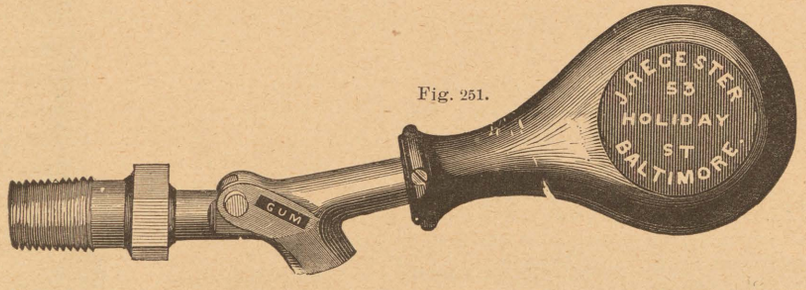
Fig. 250.



Size of Shank,	$\frac{3}{4}$	1
Price, each,	$2 50	$2 50

REGESTER'S PATENT GAUGE COCK.

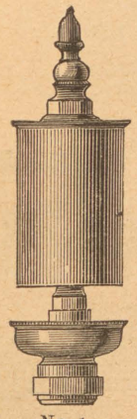
Fig. 251.



Size of Shank,	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
Price, each,	$1 50	$1 50	$1 50

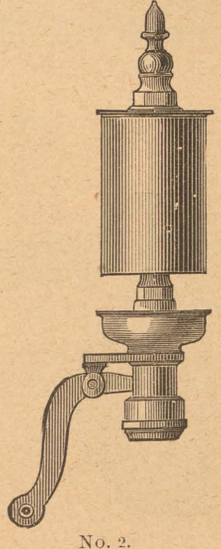
STEAM WHISTLES.

Fig. 252.



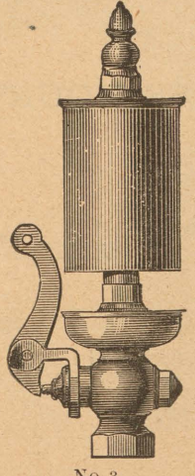
No. 1.

Fig. 253.



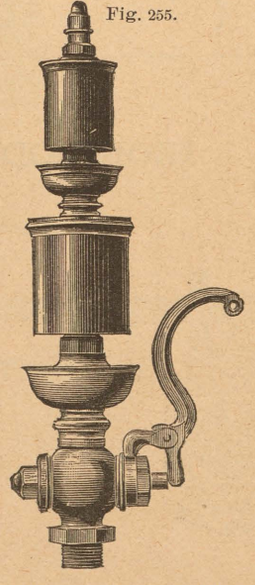
No. 2.

Fig. 254.



No. 3.

Fig. 255.



Diameter of Bell,	1	1½	2	2½	3	3½	4	5	6	8	10
Screwed for Pipe,	½	½	½	¾	1	1	1¼	1½	2	2½	2½
No. 1, without Valve,	$1 70	$2 50	$3 00	$4 00	$5 50	$ 7 75	$10 00	$16 00	$22 00	$50 00	$ 80 00
" 2, Stationary Lever,		4 00	4 25	5 50	7 00	9 50	12 00	19 00	25 00	.....	.....
" 3, Adjustable Lever,		4 60	5 00	6 25	8 00	10 50	13 50	21 00	27 00	70 00	130 00

Patent Chimes, 2 inch and 3 inch, ... $12 00

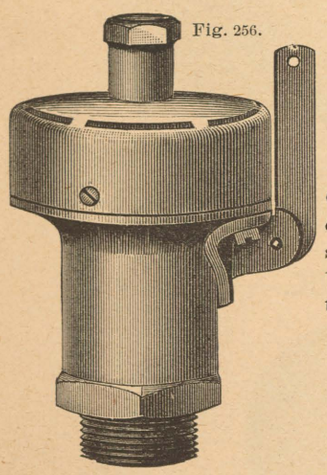
" " 2 inch, 3 inch and 4 inch (larger sizes to order) 22 00

SAFETY VALVES.

KUNKLE LOCK UP SAFETY VALVE.

Patented May 24, 1875 and July 12, 1877.

Fig. 256.



This Safety Valve is prompt and efficient, will not Corrode or stick; is entirely free from Friction; will close down without losing any fixed or desired pressure. Is perfectly automatic, and is not only a Safety Valve in name, but in fact a watchman against the destruction of Life, Limb and Property.

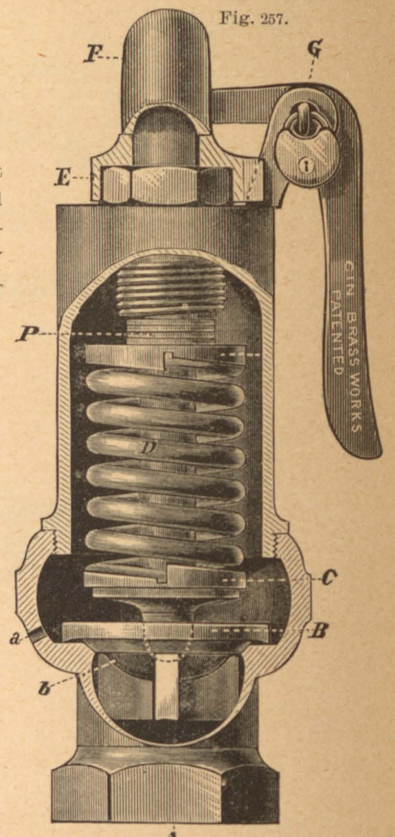
PRICE LIST.

Size of Valve.	Steam Pipe Connection.	No. of Horse Power.	PRICE.
1 inch.	¾ inch.	1 to 5	$ 8 00
1¼ "	1 "	5 to 10	12 00
1½ "	1 "	10 to 15	15 00
2 "	1½ "	15 to 30	25 00
2½ "	2 "	30 to 60	35 00
3 "	2 "	60 to 90	45 00
4 "	2½ "	90 to 130	75 00

PATENT LOCK SAFETY VALVE.

With Nickel-Plated Spring.

Fig. 257.



PRICE LIST.

1 in	$ 6 75	1½ in	$ 11 25
1¼ in	9 00	2 in	18 00

IRON BODY, BRASS MOUNTED VALVES.

Fig. 258.

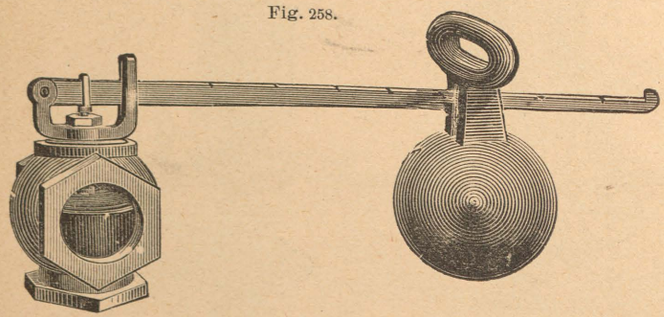
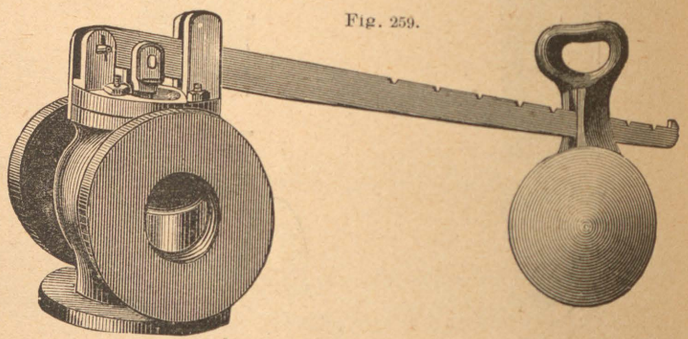


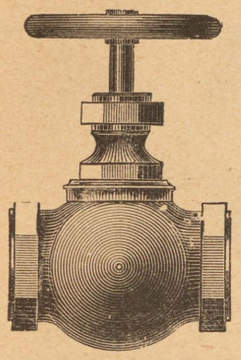
Fig. 259.



Size	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Price, Screwed, Fig. 258	2 75	3 75	4 75	6 50	12 00	15 00	20 00	24 00	.....	36 00	48 00	.....	145 00
" Flanged, Fig. 259	.....	.....	.....	8 25	14 25	18 00	23 75	28 50	.....	42 00	55 00	.....	154 00

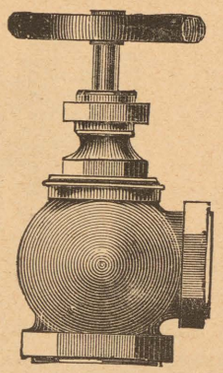
BRASS VALVES.

Fig. 260.



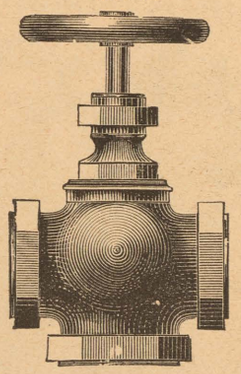
GLOBE VALVE.

Fig. 261.



ANGLE VALVE.

Fig. 262.



CROSS VALVE.

GLOBE, ANGLE, CROSS AND BUTTERFLY VALVES.

Size,	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Globe and Angle Valves,		.60	$ 75	$ 95	$1 30	$1 70	$2 60	$3 60	$5 60	$11 25	$16 00	$28 00	$40 00
Cross Valves,		.90	1 00	1 50	2 00	2 50	3 50	5 00	8 00	16 00	24 00	.....	.....
Butterfly Valves,						3 50	4 50	5 50	8 00	11 00	16 00	.....	.....

FELTHOUSEN'S PATENT OIL PUMPS.

Fig. 263.

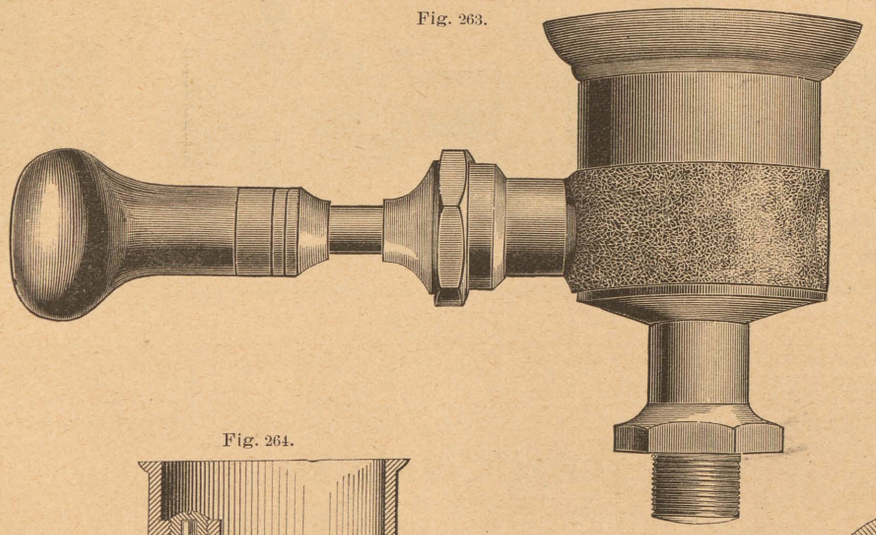
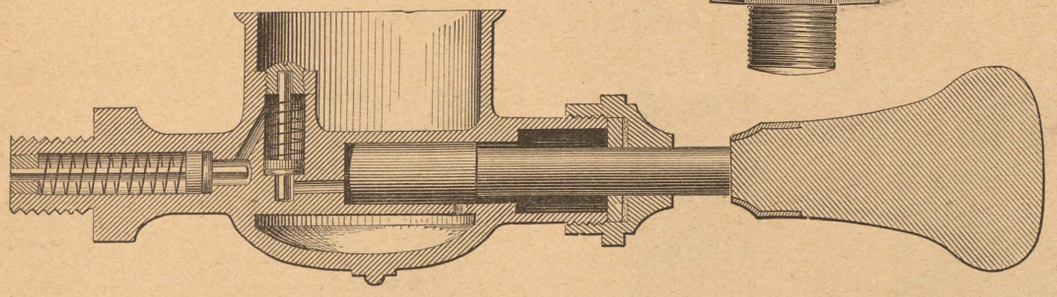


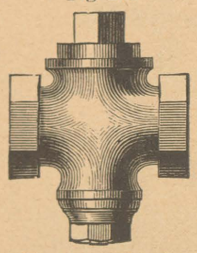
Fig. 264.



	Size.	With Screw Top.	With Strainer Top.	Extra Strainer Top.
No. 1, Rough with Bowl for Tallow,	2 x 2	$ 3 50	$ 3 50	20c.
No. 2, Finished, with Bowl for Tallow,	2 x 2	5 00	5 00	20c.
No. 03, Finished,	2 x 2	3 50	3 65	40c.
No. 3, Finished,	2 x 2	3 50	3 65	40c.
No. 04, Finished,	2¾ x 2¾	5 00	5 25	60c.
No. 4, Finished,	3½ x 3½	7 50	7 80	75c.
No. 5, Finished.	7 x 4½	12 00	12 00	....
No. 6, Finished,	2¾ x 2¾	5 00	5 25	40c.

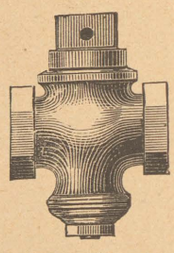
BRASS VALVES AND COCKS.

Fig 265.



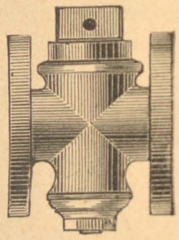
Square Head.

Fig. 266.



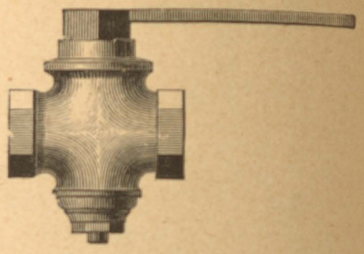
Flat Head.

Fig. 267.



Flanged.

Fig. 268.



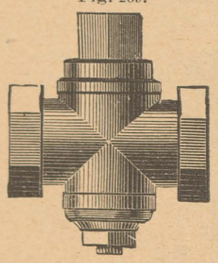
Handled.

STEAM COCKS.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Steam Cocks	65	75	1 05	1 45	2 00	3 20	4 40	6 50	13 75	20 00	.....	.....
" Handled	75	85	1 15	1 60	2 25	3 60	4 80	7 00	.....	.....	.....	.....
" Flanged Ends	.....	.....	.....	.....	5 50	8 00	10 00	15 00	22 00	32 00	53 00	75 00
" Three Way, Fig. 272	.....	.....	1 50	2 00	3 00	4 50	6 00	9 00	17 00	24 00	.....	.....

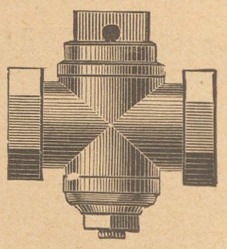
GAS SERVICE AND UNION METER COCKS.

Fig. 269.



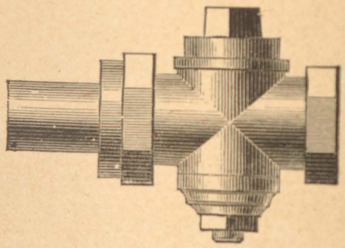
Square Head.

Fig. 270.



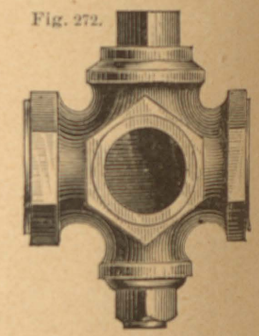
Flat Head.

Fig. 271.



U. M. Square Head.

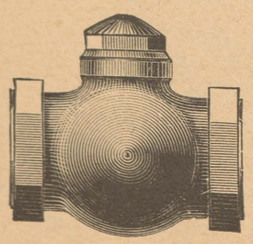
Fig. 272.



Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Gas Service Cocks	50	60	70	95	1 20	1 80	2 60	4 25	8 50	14 00
" " Handled	60	70	80	1 10	1 45	2 20	3 00	4 75	.....	.....
Union Meter Cocks	.....	.....	1 00	1 25	1 85	2 80	4 00	6 00	.....	.....
" " Handled	.....	.....	1 10	1 40	2 10	3 20	4 40	6 50	.....	.....

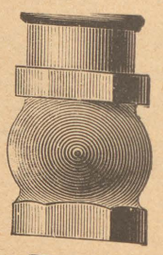
CHECK VALVES.

Fig. 273.



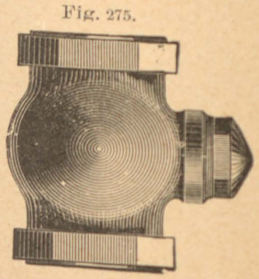
Horizontal.

Fig. 274.



Vertical.

Fig. 275.



Vertical—Cap on side.

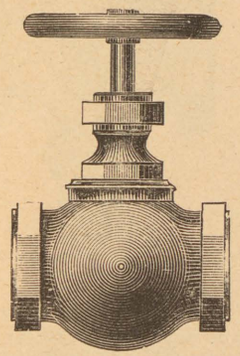
Fig. 276.

Angle.

Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Horizontal and Angle	50	55	80	1 10	1 40	2 25	3 10	4 90	10 00	14 00
Vertical	.....	.....	80	1 10	1 40	2 25	3 10	4 90	.....	.....
" Cap on side	.....	.....	90	1 30	1 65	2 75	3 70	5 60	11 00	15 00

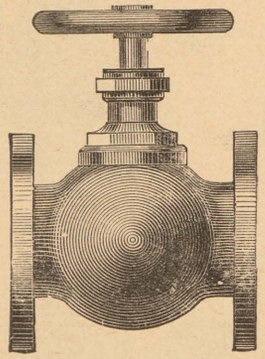
IRON BODY, BRASS MOUNTED VALVES.

Fig. 277.



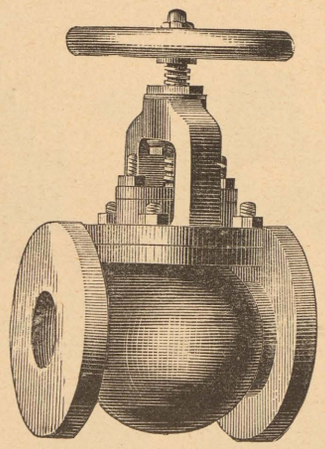
Globe.

Fig. 278.



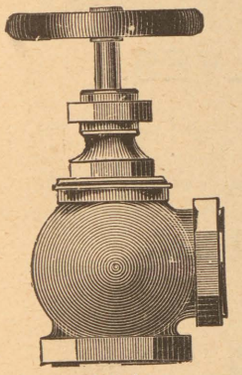
Flanged Globe.

Fig. 279.



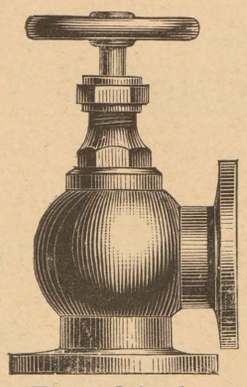
Flanged Globe, with Yoke.

Fig. 280.



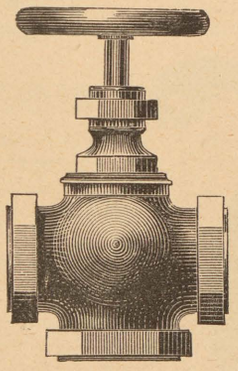
Angle.

Fig. 281.



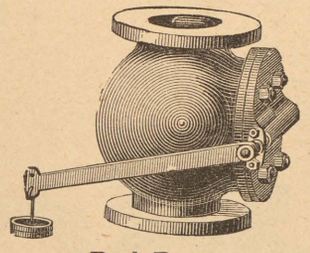
Flanged Angle.

Fig. 282.



Cross.

Fig. 283.



Back Pressure.

PRICE LIST.

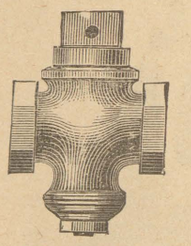
Size	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10	12
Globe and Ang. Valves	2 00	2 50	3 50	4 50	7 50	10 50	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Flanged	2 50	3 25	4 50	5 75	9 00	12 50	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " with Yoke	.....	.....	.....	7 50	10 00	14 50	16 00	20 00	28 00	32 00	44 00	65 00	75 00	120 00	.....
" " do Flngd.	.....	.....	.....	8 75	11 50	16 50	18 50	23 00	32 00	36 00	49 00	70 00	81 00	130 00	220 00
Hor. Check Valves	1 50	2 00	2 25	3 75	6 25	8 75	11 50	15 00	20 00	24 00	33 00	55 00	65 00	.....	.....
" " Flanged	2 00	2 75	3 25	5 00	7 75	10 75	14 00	18 00	24 00	28 00	38 00	60 00	71 00	100 00	190 00
Cross Valves	.....	.....	.....	6 00	10 00	14 00	21 00	26 00	.....	40 00	54 00	.....	87 00	.....	.....
" " Flanged	.....	.....	.....	7 75	12 25	17 00	24 75	30 50	.....	46 00	61 50	.....	96 00	.....	.....
Back Pressure Valves	.....	.....	.....	9 00	10 50	13 50	15 00	18 00	.....	30 00	40 00	.....	66 00	.....	.....
" " Flanged	.....	.....	.....	10 25	12 00	15 50	17 50	21 00	.....	34 00	44 00	60 00	72 00	110 00	180 00
Butterfly Valves	.....	3 50	4 50	6 00	8 00	12 00	16 00	20 00	.....	.....	.....	.....	.....	.....	.....

STANDARD DIMENSIONS OF IRON BODY FLANGED VALVES.

Size	2	2½	3	3½	4	4½	5	6	7	8	10	12
Globe Valves, Diameter of Flanges	6½	7	8	9	10	10	11	12	13	14	16	18
" " Distance, face to face	5¾	7⅜	7⅛	9½	11	11	12	13⅜	16	16½	19¾	22½
Angle " Diameter of Flanges	6½	7	8	9	10	10	11	12	13	14	16	18
" " Distance, cent. to outlet	3⅞	4½	4⅛	5⅜	5⅞	5½	6⅜	6⅝	7⅞	8¼	9⅝	11¼
" " " " inlet	3⅝	4½	4⅛	5⅜	5⅞	5½	6⅜	6⅝	7⅞	8¼	9⅝	11¼
Safety " Diameter of Flanges	6½	7	8	9	10	10	11	12	.....	.....	.....	.....
" " Distance, face to face	7	8 5/16	9¼	10½	11⅜	11	12¾	14¼	.....	.....	.....	.....
" " " center to inlet	3½	4 3/16	4⅝	5¼	5¾	5½	6⅜	7⅛	.....	.....	.....	.....

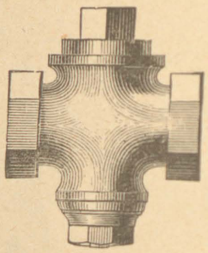
IRON COCKS.

Fig. 284.



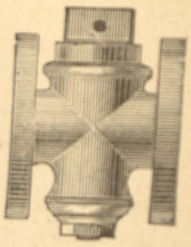
Flat Head.

Fig. 285.



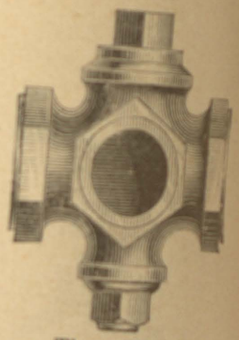
Square Head.

Fig. 286.



Flanged.

Fig. 287.



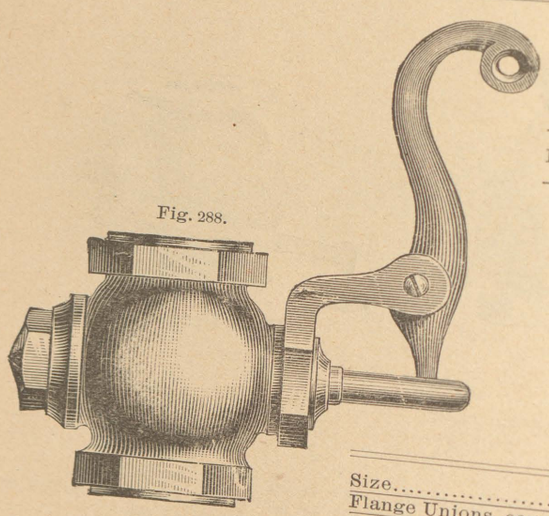
Three-Way.

Size	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6
All Iron	50	60	70	90	1 35	1 90	2 30	4 25	6 25	10 00	13 00	28 00	45 00
" " Brass Washers	.....	75	85	1 05	1 55	2 15	2 70	5 00	7 00	11 00	14 50	32 50	62 00
With Brass Plugs	.....	90	1 15	1 40	2 25	3 00	4 50	8 00	12 00	20 00	25 00	.....	.....
Flanged Ends, all Iron	.....	.....	.....	.....	.....	.....	3 55	5 75	8 25	12 50	16 00	32 00	50 00
" with Brass Plugs	.....	.....	.....	.....	1 50	2 25	2 90	5 00	7 25	12 00	16 00	.....	.....
Three-Way, all Iron	.....	.....	.....	.....	2 40	3 35	5 10	8 75	13 00	22 00	28 00	.....	.....
" with Brass Plugs	.....	.....	.....	.....	2 75	3 75	4 90	7 25	10 25	15 75	21 50	38 00	57 50
" Flanged, all Iron	.....	.....	.....	.....	3 65	4 85	7 10	11 00	16 00	25 75	32 50	.....	.....
" " with Brass Plugs	.....	.....	.....	.....									

WHISTLE VALVES.

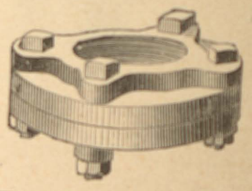
Size	½	¾	1	1¼	1½	2	2½	3
Price	2 00	2 50	3 00	4 00	5 50	8 00	12 00	16 00

Fig. 288.



FLANGE UNION.

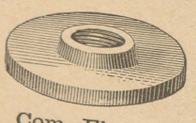
Fig. 289.



Size	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10	12
Flange Unions, complete	60	60	70	80	1 00	1 20	1 50	1 90	2 30	2 80	4 50	5 00	6 50	8 00	10 00	14 00	20 00

CAST IRON FLANGES.

Fig. 290.



Com. Flange.

Size of Pipe.	Price and Diameter of Common Flanges.—Fig. 290.																						
	3	3½	4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½	12	13	14	15	16	17
⅜ in	14	17	20	23	26	29	32	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
½ "	14	17	20	23	26	29	32	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
¾ "	.....	18	21	25	29	33	38	43	49	55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1 "	.....	.....	22	26	31	36	42	48	54	61	68	75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1¼ "	.....	.....	24	28	33	38	44	50	56	63	70	78	88	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1½ "	.....	.....	.....	31	36	41	47	53	60	68	78	88	98	1 08	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2 "	.....	.....	.....	.....	.....	44	50	56	63	71	81	91	1 02	1 15	1 29	1 44	1 60	.....	.....	.....	.....	.....	.....	.....
2½ "	.....	.....	.....	.....	.....	.....	55	61	70	79	89	1 00	1 15	1 30	1 45	1 62	1 80	2 00	2 25	.....	.....	.....	.....	.....
3 "	.....	.....	.....	.....	.....	.....	.....	64	73	84	96	1 08	1 22	1 37	1 52	1 69	1 90	2 12	2 35	2 60	.....	.....	.....	.....
3½ "	.....	.....	.....	.....	.....	.....	.....	.....	75	87	1 00	1 13	1 26	1 40	1 56	1 74	1 95	2 18	2 42	2 68	.....	.....	.....	.....
4 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 04	1 22	1 40	1 58	1 76	1 96	2 16	2 36	2 56	2 80	3 05	.....	.....	.....	.....
4½ "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 55	1 70	1 90	2 10	2 32	2 54	2 76	3 00	3 25	.....	.....	.....	.....
5 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 65	1 80	2 00	2 20	2 40	2 60	2 80	3 00	3 20	3 45	3 75	.....	.....
6 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 20	2 40	2 60	2 80	3 00	3 20	3 45	3 75	4 10	4 50	5 00	5 50
7 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.75	4 10	4 50	5 00	5 50
10 "	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 00	4 50	5 00	5 60	6 25
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 00	6 60	7 25

MORLEY BROTHERS

KENNEDY'S OPEN WAY DOUBLE GATE VALVES.

IRON BODY STEAM AND WATER VALVES, DOUBLE GATES TO BEAR HEAVY PRESSURE ON EITHER FACE, BRASS MOUNTED.

Fig. 291.

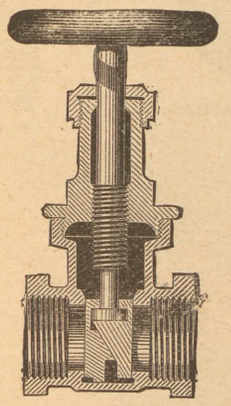
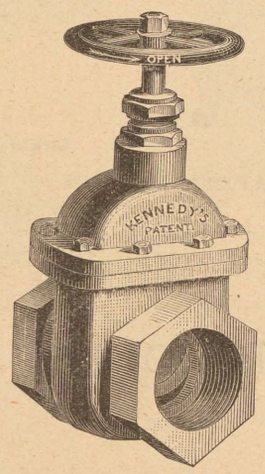
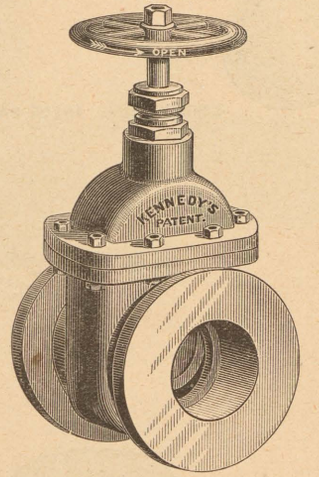


Fig. 292,



SCREWED END.

Fig. 293.



FLANGED END.

PRICE LIST OF BRASS VALVES.

Size of Opening in Inches.	*Diameter of Standard Flanges.*	*Screwed End.*	*Flanged End.*	*Extra for Lever Valves. Net.*
½		$ 1 20		$1 00
¾		1 75		1 00
1		2 50		1 00
1¼		3 50		1 00
1½		5 00		1 00
2	6	7 50	$12 00	1 00
2½	6½	15 00	22 00	1 25
3	7	22 00	26 00	1 25
3½	8½			1 25
4	9			1 25
..	..			1 25

PRICE LIST OF IRON BODY, BRASS MOUNTED VALVES.

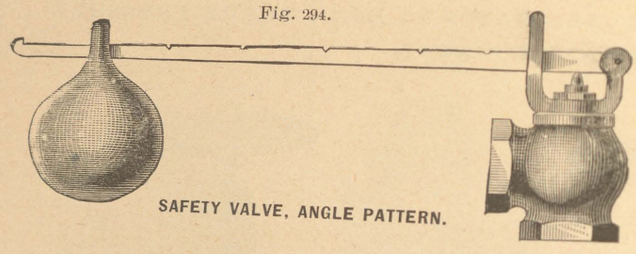
Size of Opening in Inches.	*Diam. of Standard Flanges.*	*Face to Face Flange End.*	*Face to Face Screw End.*	*End to End of Hubs.*	*Screwed, Flanged or Hub Ends.*	*Extra for Lever Valves. Net.*
2	6	5¾	4¾		$ 7 50	$1 00
2½	7	6½	6		12 00	1 25
3	8	7½	7	9⅜	15 00	1 25
3½	8½	7½	7½	9½	18 00	1 25
4	9	8	8¼	10	20 00	1 25
5	10	9⅛	9⅛	12	25 00	1 25
6	11	9⅞	9¾	12⅜	30 00	1 25
7	12	11			40 00	1 25
8	13	11½	11	14¼	50 00	1 25
10	16	12		15	65 00	
12	18	13		15½	90 00	
14	21	13¾		15¾		
16	23			16¼		
18	25			17½		

PLEASE NOTICE.—That all Iron Body Valves have Stationary Spindles. That Screwed and Flanged End Valves have Wheel on Spindle, and open by turning to left, unless otherwise ordered. That Hub or Spigot End Water Gates have two inch square Nut on Spindle, and that those above six inches open by turning to right, according to general custom, unless otherwise ordered.

In ordering Valves, delay will be avoided by giving full details of kind wanted, whether Screw, Flange, Hub or Spigot End, Handwheel, or Nut on Spindle, Composition mounted, or otherwise, and whether to turn to right or left to open.

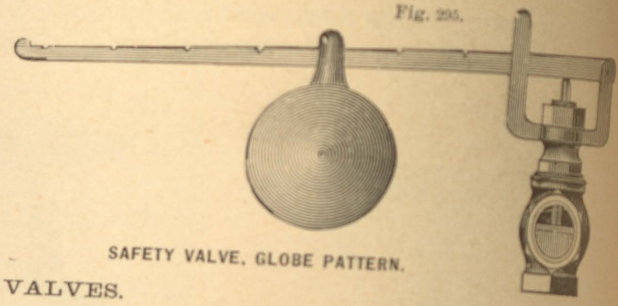
BRASS SAFETY VALVES.

Fig. 294.



SAFETY VALVE, ANGLE PATTERN.

Fig. 295.



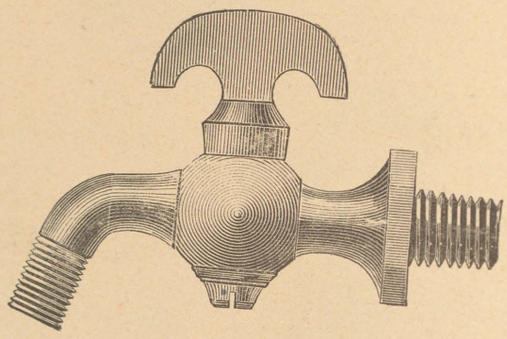
SAFETY VALVE, GLOBE PATTERN.

SAFETY VALVES.

Size,	½	¾	1	1¼	1½	2
Safety Valves,	$2.25	$2.80	$3.80	$5.50	$7.00	$11.00
" " Angle Pattern,	2.25	2.80	3.80	5.50	7.00	11.00
Low Pressure Safety Valves,	.....	.....	3.00	4.00	5.00	.....

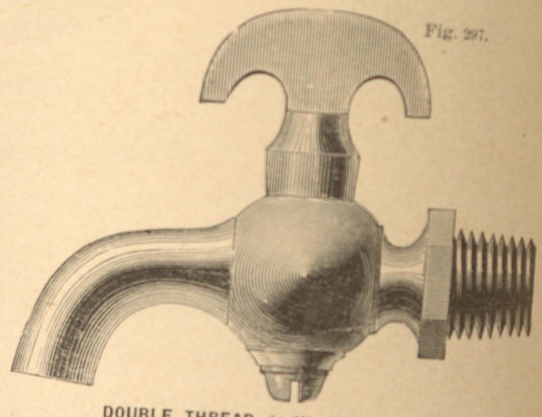
AIR COCKS.

Fig. 296.



SINGLE THREAD, ¼ IN. FULL SIZE.

Fig. 297.

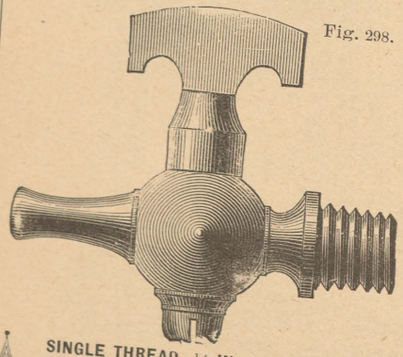


DOUBLE THREAD, ⅜ IN. FULL SIZE.

BIBB NOZZLE AIR COCKS.

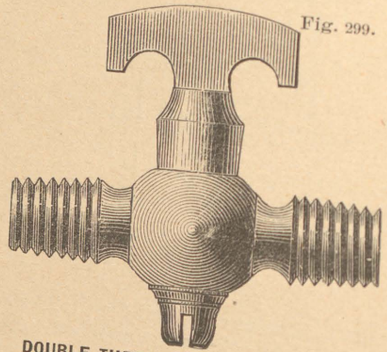
Size,	⅛	¼	⅜	½
Single Thread,	.58	.58	.75	$1.75
Double Thread,	.62	.62	.80	2.25

Fig. 298.



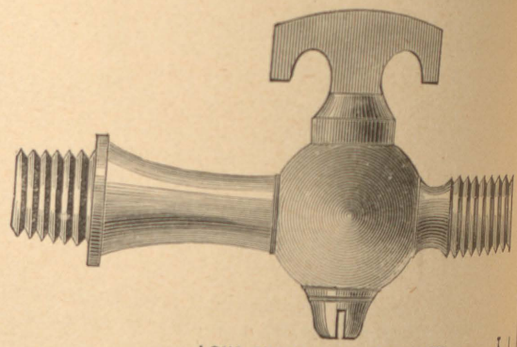
SINGLE THREAD, ¼ IN. FULL SIZE.

Fig. 299.



DOUBLE THREAD, ¼ IN. FULL SIZE.

Fig. 300.



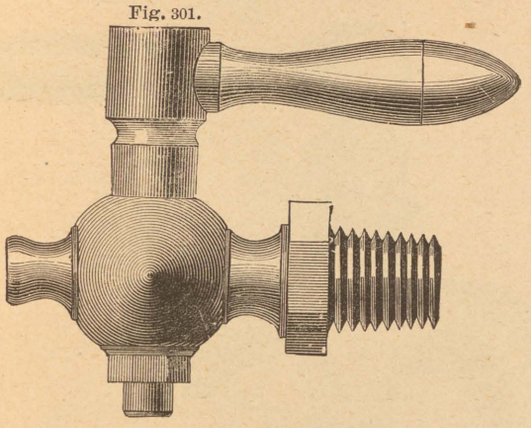
LONG SHANK, ¼ IN. FULL SIZE.

AIR COCKS.

Size,	⅛	¼	⅜	½
Single Thread,	.38	.38	$ .60	$ .90
Double Thread,	.45	.45	.76	1.10
Long Shank,	.70	1.25	.....	.....

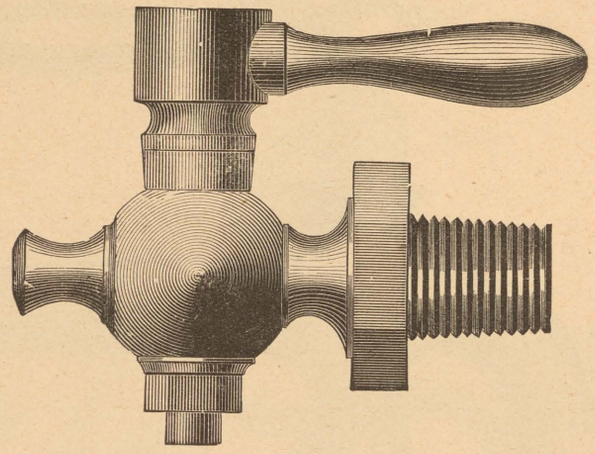
CYLINDER COCKS.

Fig. 301.



¼ IN. FULL SIZE.

Fig. 302.

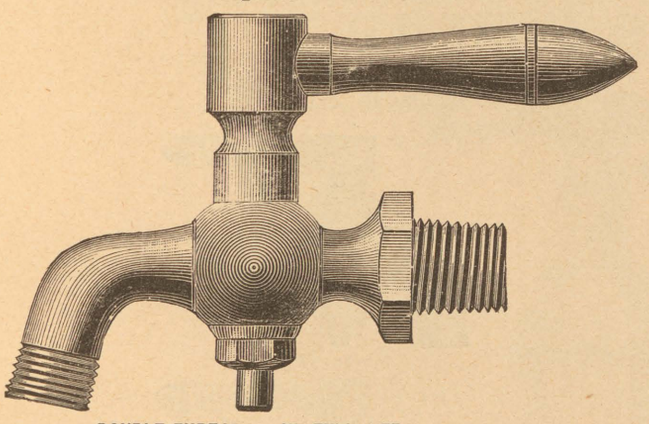


⅜ IN. FULL SIZE.

Size of Shank	½	⅝	¾	1
Will chase (Iron Pipe Size)	¼	⅜	½	¾
Lever Handle, Finished	.75	.95	$1 45	$2 00
Tee Handle, Finished	.70	.90	1 35	1 90
Lever Handle, Rough	.60	.80	1 25	1 80
Tee Handle, Rough	.55	.75	1 15	1 70
Lever Handle, Finished, with Couplings		$1.15	1 70	2 30

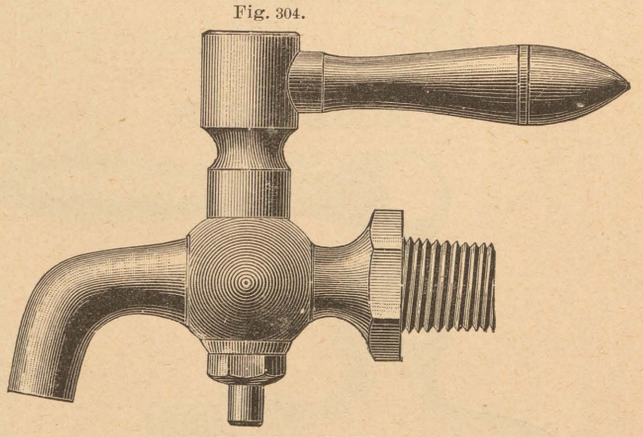
BIBB NOZZLE CYLINDER COCKS.

Fig. 303.



DOUBLE THREAD, ¼ IN. FULL SIZE.

Fig. 304.

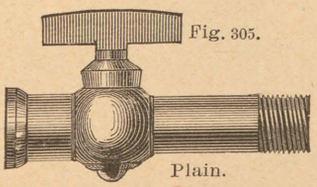


SINGLE THREAD, ¼ IN. FULL SIZE.

Size of Shank	½	⅝	¾	1
Will chase (Iron Pipe Size)	¼	⅜	½	¾
Lever Handle, Finished	.75	.95	$ 1 45	$ 2 00
Tee Handle, Finished	.70	.90	1 35	1 90
Lever Handle, Rough	.60	.80	1 25	1 80
Tee Handle, Rough	.55	.75	1 15	1 70

STEAM GAUGE COCKS.

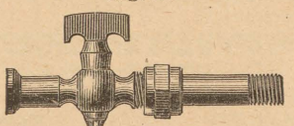
Fig. 305.



Plain.

Plain, with T Handle.....58c.
" " Lever Handle.....90c.

Fig. 306.



With Union T Handle.

With Union, T Handle.....$1 00
" " Lever Handle..... 1 25

PLAIN BIBBS.

Fig. 307.

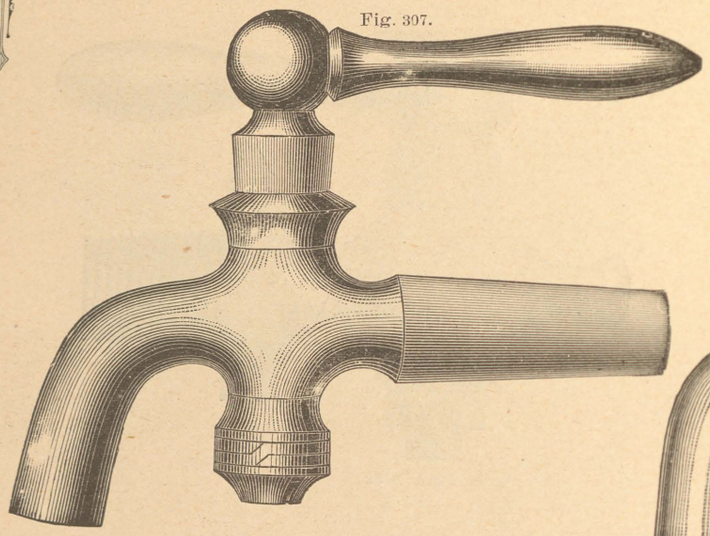
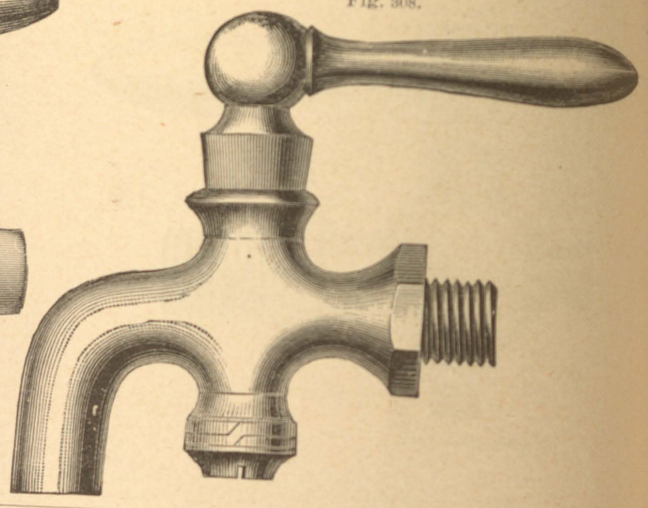


Fig. 308.



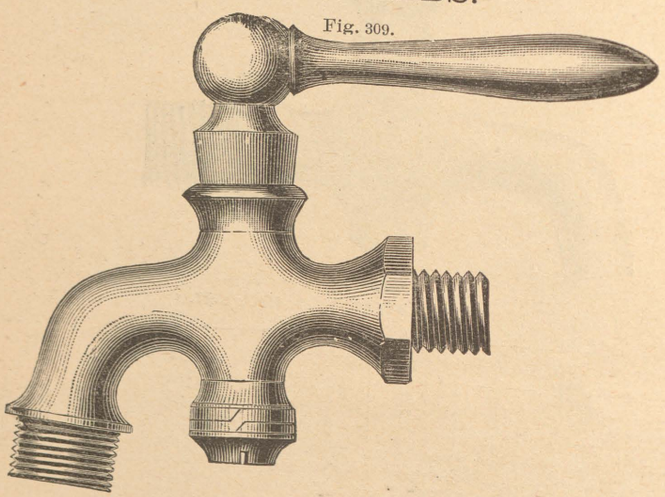
Size	¼	⅜	½	⅝	¾	1	1¼	1½	2
Finished per dozen	$ 9 00	$11 00	$14 50	$18 00	$24 00	$36 00	$54 00	$84 00	$170 00
Rough " "	8 00	10 00	13 00	16 00	21 00	32 00	48 00	72 00	150 00
Nickel Plated " "	11 00	13 00	17 00	20 50	26 50	39 00	.....	.....	.....
Silver Plated " "	16 00	18 50	23 50	30 00	39 00	62 00	.....	.....	.....

PLAIN BIBBS.—Screwed for Iron Pipe.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2
Finished per dozen	$10 00	$12 00	$15 50	$19 00	$26 00	$39 00	$58 00	$96 00	$180 00
Rough " "	9 00	11 00	14 00	17 00	23 00	35 00	50 00	78 00	160 00
Nickel Plated " "	12 00	14 00	18 00	21 50	28 50	42 00	.....	.....	.....
Silver Plated " "	17 00	19 50	24 50	31 00	41 00	65 00	.....	.....	.....

HOSE BIBBS.

Fig. 309.



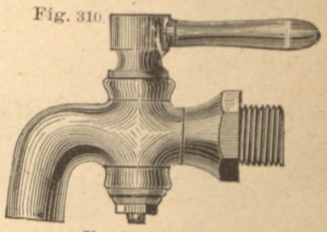
Size	½	⅝	¾	1	1¼	1½	2
Finished per dozen	$15 50	$19 00	$26 00	$39 00	$60 00	$90 00	$180 00
Rough " "	14 00	17 00	23 00	35 00	50 00	78 00	160 00
Nickle Plated " "	18 00	21 50	28 50	42 00	.....	.....	.....
Silver Plated " "	24 50	31 00	41 00	65 00	.....	.....	.....

HOSE BIBBS.—Screwed for Iron Pipe.

Size	½	⅝	¾	1	1¼	1½	2
Finished per dozen	$16 50	$20 00	$28 00	$42 00	$62 00	$96 00	$190 00
Rough " "	15 00	18 00	25 00	38 00	54 00	84 00	170 00
Nickel Plated " "	19 00	22 50	30 50	45 00	.....	.....	.....
Silver Plated " "	25 50	32 00	43 00	68 00	.....	.....	.....

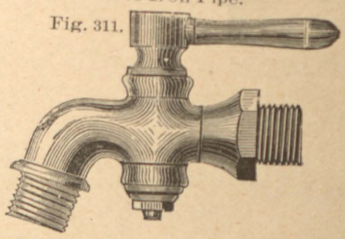
STEAM BIBBS.

Fig. 310.



For Iron Pipe.

Fig. 311.



For Hose Nozzle.

Size	¼	⅜	½	⅝	¾	1	1¼	1½	2	2½
Finished	$1 15	$1 40	$1 75	$2 10	$2 75	$4 35	$7 00	$10 65	$16 65	$25 00
Rough	1 00	1 25	1 50	1 75	2 35	3 65	6 00	9 50	14 60	22 50
Se'w Noz., Fin'd	1 35	1 65	2 00	2 35	3 00	4 65	.....	.....	.....	.....
Nozzle Rough	1 20	1 40	1 75	2 00	2 60	4 00	.....	.....	.....	.....

COMPRESSION PLAIN BIBBS.

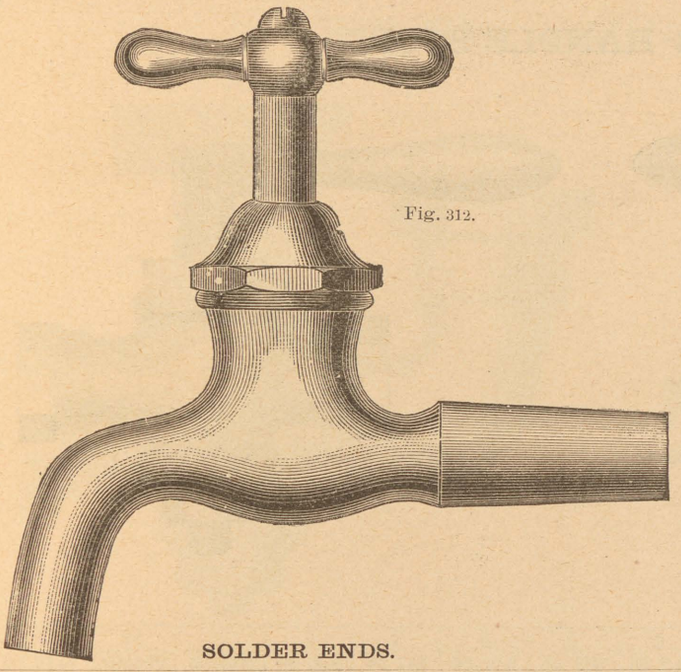


Fig. 312.

SOLDER ENDS.

Size	⅜	½	⅝	¾	1
Finished, per doz	9 00	10 00	12 00	18 00	34 00
Rough "	8 50	9 50	11 00	17 00	30 00
Nickel Plated, "	11 00	12 50	14 50	20 50	37 00
Silver " "	16 50	19 00	24 00	33 00	60 00

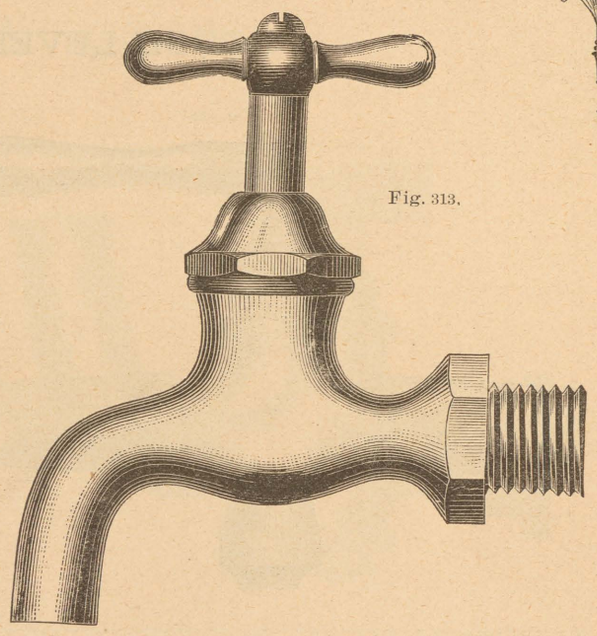


Fig. 313.

SCREWED FOR IRON PIPE.

Size	⅜	½	⅝	¾	1
Finished, per doz	10 00	11 00	13 00	20 00	37 00
Rough "	9 50	10 50	12 00	19 00	33 00
Nickel Plated "	12 00	13 50	15 50	22 50	40 00
Silver " "	17 50	20 00	25 00	35 00	63 00

COMPRESSION HOSE BIBBS.

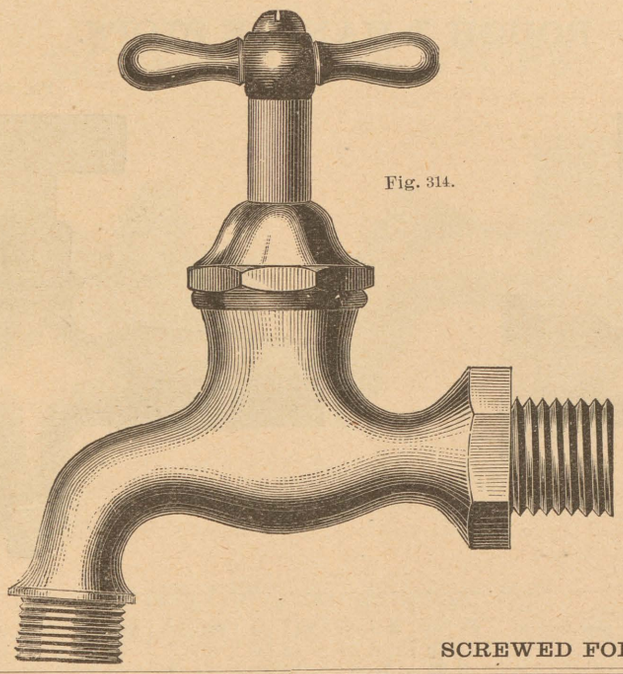


Fig. 314.

SOLDER ENDS.

Size	½	⅝	¾	1
Finished, per doz	11 00	13 00	20 00	37 00
Rough "	10 50	12 00	19 00	33 00
Nickel Plated "	13 50	15 50	22 50	40 00
Silver " "	20 00	25 00	35 00	63 00

SCREWED FOR IRON PIPE.

Size	½	⅝	¾	1
Finished, per doz	12 00	14 00	22 00	40 00
Rough "	11 50	13 00	21 00	36 00
Nickel Plated "	14 50	16 50	24 50	43 00
Silver " "	21 00	26 00	37 00	66 00

ROUGH LEVER HANDLE STOPS.

Fig. 315.

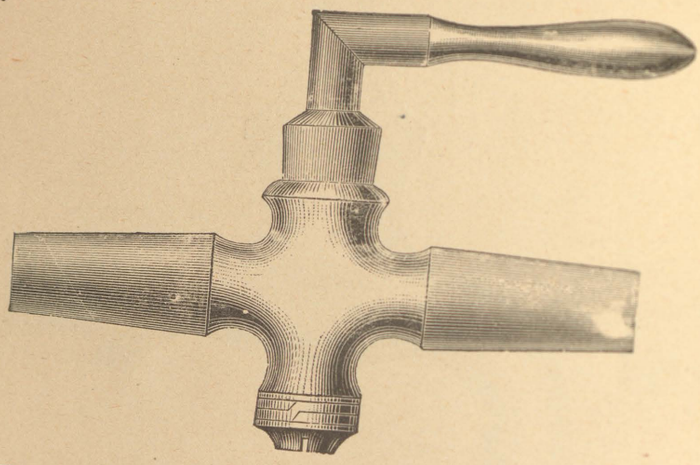
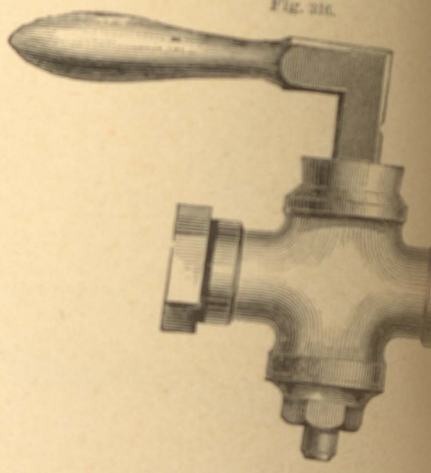


Fig. 316.



Size, inches,	¼	⅜	½	⅝	¾	1	1¼	1½	2
To Solder both Ends, per dozen	$7 00	$ 9 00	$11 00	$13 00	$17 50	$26 00	$43 00	$64 00	$110
For Lead and Iron Pipe, "	7 50	9 50	11 50	13 50	18 50	27 00	44 50	66 00	115
For Iron Pipe, "	8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120
Stop and Waste, Solder, "	8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120
" " Iron Pipe, "	9 00	11 00	13 00	15 00	20 50	30 00	49 00	72 00	130

ROUGH T HANDLE STOPS.

Fig. 317.

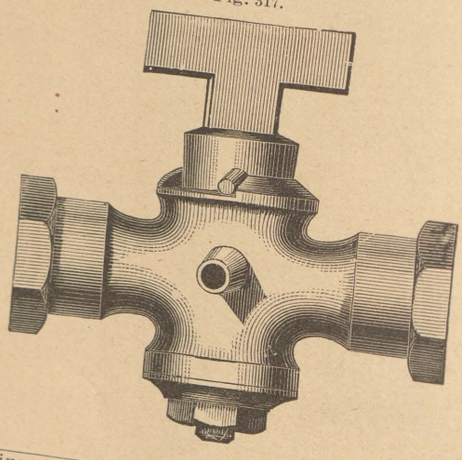
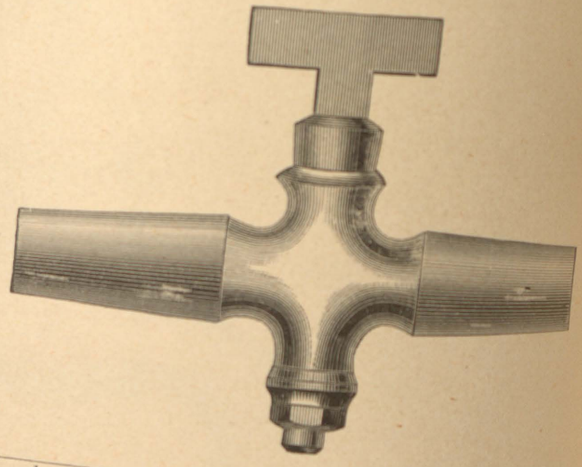


Fig. 318.



Size, inches,	¼	⅜	½	⅝	¾	1	1¼	1½	2
To Solder, per dozen,	$7 00	$ 9 00	$11 00	$13 00	$17 50	$26 00	$43 00	$64 00	$110 00
For L. P. and I. P., "	7 50	9 50	11 50	13 50	18 50	27 00	44 50	66 00	115 00
For Iron Pipe, "	8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120 00
To Solder Stop and Waste, "	8 00	10 00	12 00	14 00	19 00	28 00	46 00	68 00	120 00
For Iron Pipe, Stop and Waste, "	9 00	11 00	13 00	15 00	20 50	30 00	49 00	72 00	130 00

ROUGH HYDRANT COCKS.

Fig. 319.

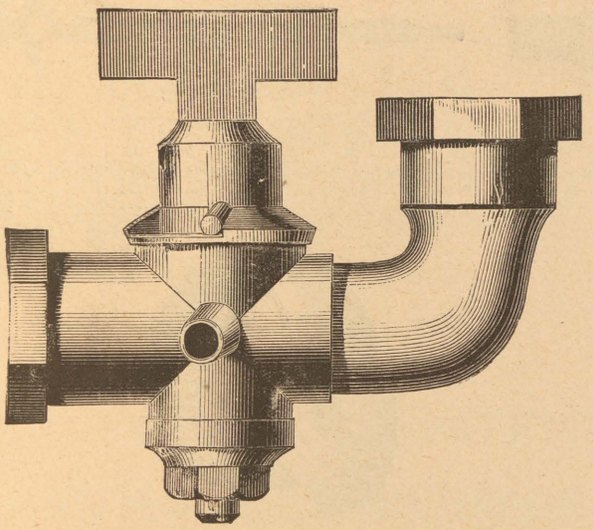
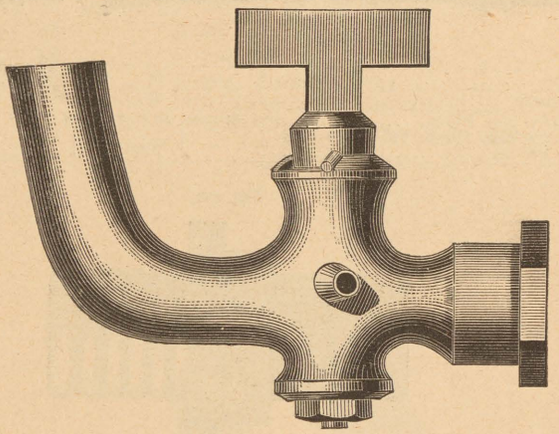


Fig. 320.



Size,		$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1
To Solder,	per dozen	$11 50	$14 00	$19 00	$28 00
One end L. P., other I. P.,	" "	12 00	15 00	20 00	29 00
For Iron Pipe,	" "	12 00	15 00	20 50	30 00

CORPORATION STOPS.

Fig. 321.

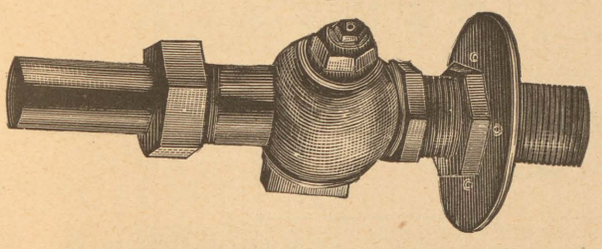
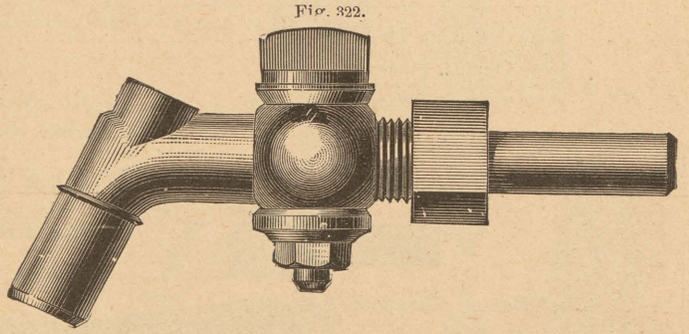


Fig. 322.



Size,		$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Price, Figure 322,	per dozen	$15 00	$16 00	$20 00	$29 00	$46 00	$100 00
Flanged, for Wood Pipe, Figure 321,	" "	.....	24 00	30 00	36 00	54 00	.....

HYRDANT NOZZLES, &c.

Size, inches,	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Hydrant Nozzles for Lead Pipe, per doz.,	.....	$4 00	.....	$5 00	$6 50	.....	.....	.....
" " " Iron Pipe with Fl'nge, "	.....	5 00	.....	6 00	7 50	.....	.....	.....
Full Soldering Unions, "	$2 50	3 50	$4 50	5 50	8 00	$11 00	$18 00	$30 00
Half Soldering Unions, "	2 75	3 00	.....	3 50	5 75	8 50	11 00	16 00
Soldering Nipples, In or Outside Screw, "	2 25	2 50	.....	3 00	5 00	7 50	10 00	14 00

HOSE PIPES, &c.

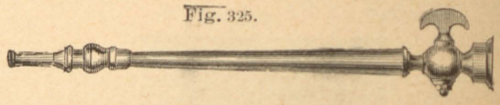
Fig. 323.

Short or Long.

Fig. 324.

To Tie On.

Fig. 325.



Short or Long.

Size	¾	¾	¾	¾	¾	1	1	1	1¼	1¼	1½	1½	2	2	2½	2½
Length	6	8	9	10	12	8	10	12	12	15	12	15	12	15	15	20
Screw Tip. Plain.....per dozen	$5 50	$ 7 00	$ 7 50	$ 8 50	$ 9 00	$ 9 00	$10 50	$12 00	$17 00	$21 00	$20 00	$25 00	$32 00	$40 00	$60 00	$100 00
Screw Tip. Cock on Large End " "	.....	12 00	14 00	.....	15 00	14 00	.....	18 00	.....	34 00	.....	.....	.....	.....	.....	.....
To Tie on..... " "	3 50	.....	.....	.....	.....	4 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Fig. 326.

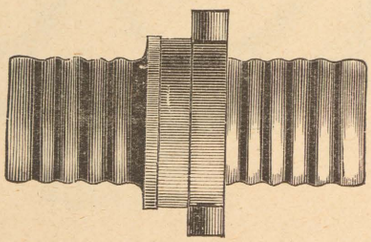


Fig. 327.

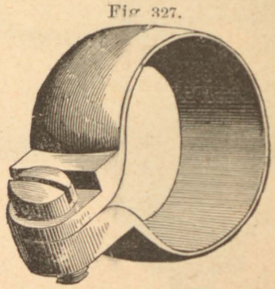


Fig. 328.

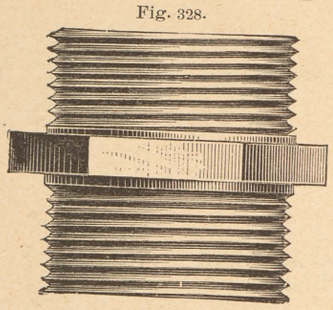
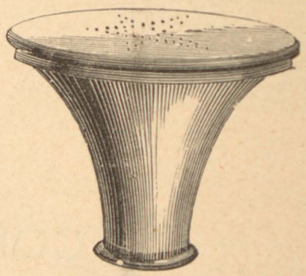


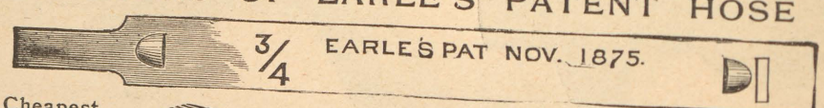
Fig. 329.



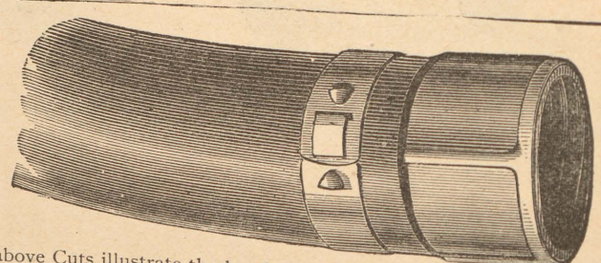
Size	½	¾	1	1¼	1½	2	2½
Hose Couplings, Figure 326.....per dozen	$ 2 40	$ 2 40	$ 4 40	$10 00	$14 00	$24 00	$40 00
Cadwell's Hose Bands..... " "	40	60	80	1 00	1 20	1 60	2 00
Hose Clamps, Figure 327..... " "	1 75	2 00	2 25	2 50	4 00	5 00	7 00
Hose and Iron Pipe Nipples..... " "	3 50	5 00	7 00	10 00	14 00	28 00	40 00
Hose Sprinkler (Size refers to Top)..... " "	.....	.....	.....	.....	2 50	3 25	5 50

Fig. 330.

MANUFACTURERS OF EARLE'S PATENT HOSE BANDS.



The Best, Cheapest and Most Durable in the Market. Are warranted to Stand a Greater Pressure than ordinary fastenings, and the time saved in adjusting them to the hose will amply repay the cost.



Each size is tested to double ordinary water pressure.

The above Cuts illustrate the band, and its appearance after it is attached.

— PRICE LIST. —

½ inch	$ 40 per doz.	1½ inch	$1 20 per doz.
¾ "	60 "	1¾ "	1 40 "
1 "	80 "	2 "	1 60 "
1¼ "	1 00 "	2¼ "	1 80 "

MENDING THIMBLES.

2½ inch	$2 00 per doz.
Vise Clamps, ½ in. to in. inclusive	6 00 "
" 1 to 2 in. inclusive...	9 00 "
Hand Clamps	15 00 "

SEND FOR DISCOUNTS.

HYDRANT SUNDRIES.

Size,	⅜	½	⅝	¾	1	1¼	1½	2
Hydrant Clamps, Brass,	.....	.20	.20	.30	.38	.....	.....	.....
" Rod Sockets, Brass,	.19	.30	.40	.40	.....	.....	.....	.....
Hose Bibb Ends,	.....	$2.00	$2.00	$2.00	$3.00	$6.00	$8.00	$15.00
Street Washer Screws, Short for Iron Pipe,	.....	5.00	.....	5.50	6.50	.....	.....	.....
" " " Long for Lead Pipe,	.....	5.50	.....	6.00	8.50	.....	.....	.....
" " " Long for Iron Pipe,	.....	6.00	.....	7.00	9.00	.....	.....	.....

Hydrant Clamps, Malleable Iron, all sizes, ... 15 cents per pound
Hydrant Rod Sockets, Malleable Iron, all sizes, ... 15 " " "
Hydrant Handles, " " " " ..... 15 " " "
Street Washer Keys, ... 15 " " "

SHRIVER'S PATENT ANTI-FREEZING HYDRANT.

These Hydrants are made in three sizes, Nos. 1, 2 and 3.

No. 1 is the smallest, stock being of ¾ pipe, has same form as No. 2 with exception of a Soldering Nipple being substituted for Hose Nozzle. It is designed only for out-of-door Hopper-Closets. Thus used with a Philadelphia, or other Hopper, connected with sewer, it forms a neat and clean closet that is fast doing away with privy vaults in Cities and Villages.

No. 2 is precisely the same as No. 3 in every respect, except in ornamental appearance.

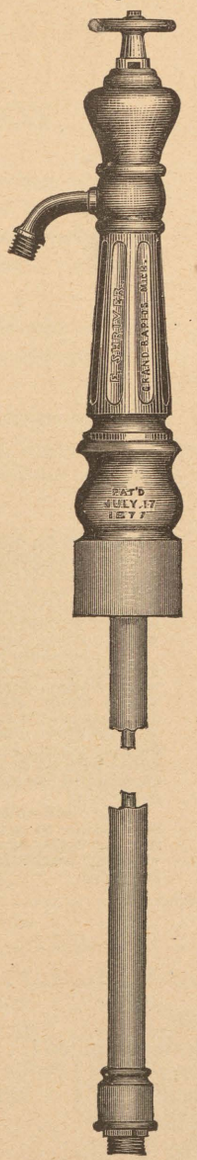
No. 3 is designed for Front Yards, Lawns, or wherever ornamental appearance is desired. In this pattern the stem extends through Stock screwing into same near Nozzle.

Nos, 2 and 3 are fitted to use Key in place of Wheel for exposed situations, if desired.

Water Works and Corporations will find that the use of these Hydrants will prove a great saving of water and for their benefit to use and recommend.

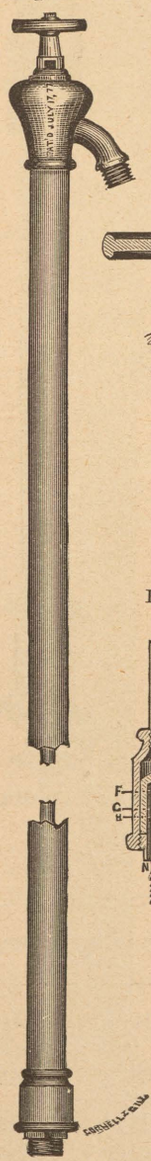
To Set in Ground.	3 Feet.	4 Feet.
No. 1, Hydrant for Hopper Closets, Figure 333,	$5 25	$5 50
No. 2, Yard Hydrant, Figure 332,	5 65	6 00
No. 3, Yard Hydrant, Figure 331,	7 65	8 00
Nut to take place of Wheel, with Key,		35

Fig. 331.



No. 3.

Fig. 332.



No. 2.

Fig. 333.

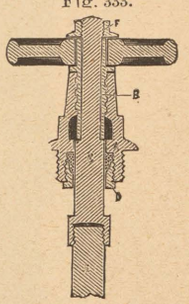
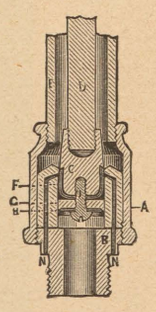
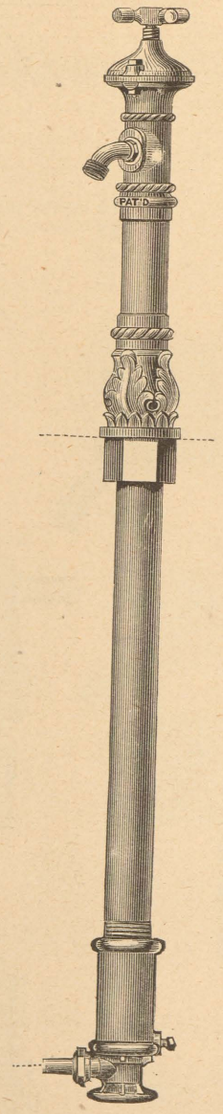


Fig. 334.



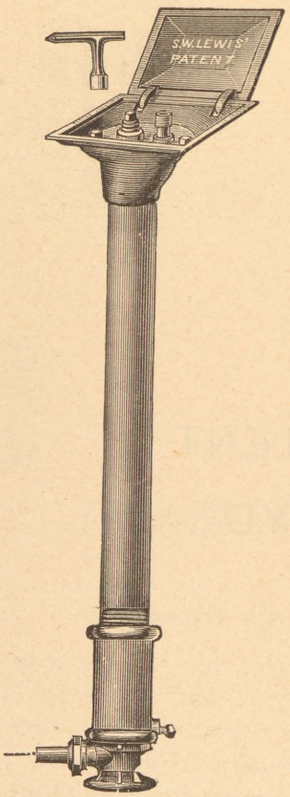
LEWIS' ANTI-FREEZING HYDRANT.

Fig. 335.



Wheel Hydrant.

Fig. 336.



Street Washer.

Agents for Lewis' Anti-freezing Hydrant with Murdock's patents combined. The most durable, simple and strongest ever made. With auxiliary Duplex Stop-Valve and fitted with Ground Union Joint for either lead or iron pipe as ordered.

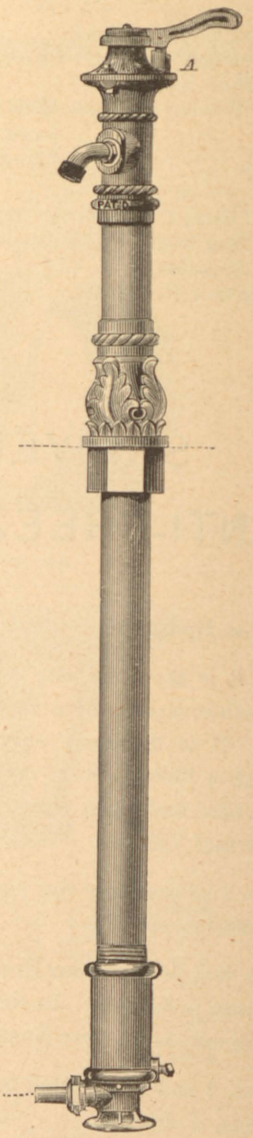
The Valve consists of two simple leather packings (working in a perfectly smooth brass chamber) on a moving water-way shutting against the pressure.

In operation the waste is closed before the supply opens, and in closing the supply is completely shut off before the waste opens, thus avoiding the unnecessary waste of water, which would result if the Hydrant was running and wasting at the same time, as other hydrants do when partly open.

The Valve can be easily lifted out and repaired without digging up the ground or shutting off the water, it being provided with an auxiliary or duplex stop-valve which closes the supply the instant the valve is removed either for inspection or repair.

A ground union joint for either lead or iron service pipe is adjustable to any angle, and a dead air space between the moving water-way and outer case, effectually protects the working parts from the surrounding earth and prevents freezing.

Fig. 337.



Self-Closing Hydrant.

Handle changes to either side.

To be set in the ground	3 feet.	4 feet.	5 feet.	6 feet.
¾ inch Hydrants, Fig. 335	$ 10.00	$ 11.00	$ 12.00	$ 13.00
¾ " Self Closing, Fig. 337	11.00	12.00	13.00	14.00
¾ inch Street-Washer, Large Case } Same capacity,	8.50	9.50	10.50	11.50
¾ " " Small " } Fig. 336.	7.70	8.70	9.70	10.70
1 inch Hydrants, Fig. 335	12.50	13.50	14.50	15.50
1 " Street-Washer, Fig. 336	10.00	11.00	12.00	13.00

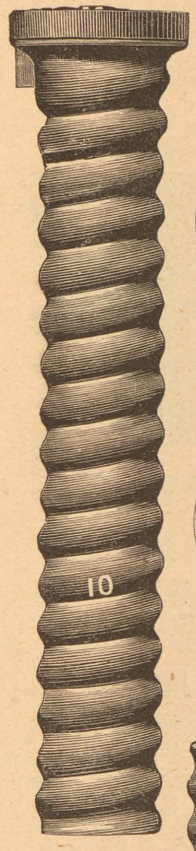
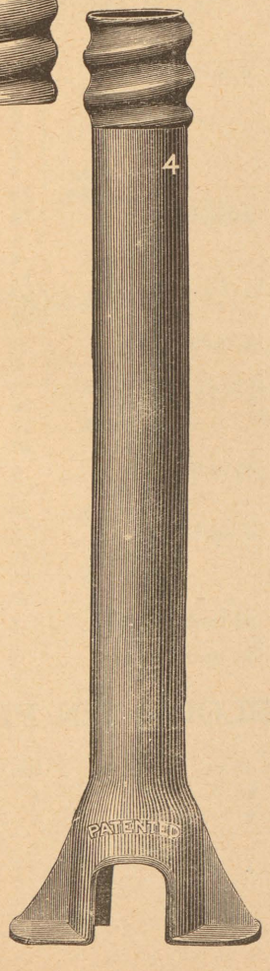


Fig. 338.

Fig. 339.

Fig. 340.



EXTENSION SHUT OFF BOX,

— FOR —

GAS AND WATER, STREET MAIN AND SERVICE PIPES.

CAST IRON.

SERVICE BOX.

As shown in illustration, the box is in two sections, which screw together, thus forming one continuous pipe or box, and can be adjusted exactly to length required, remaining when set, firm as one pipe.

At the base is a Flange on each side of opening, preventing the settling on, and springing Service Pipe.

The Cover is secured with a Brass Bolt to a Lug on inside of box, which prevents the same from being lost or opened by any unauthorized person.

The Bolt being brass is free at all times to be opened with the proper key for same.

Any special length or diameter made to order as desired.

All Boxes are coated with Coal Tar inside and out to protect from rust.

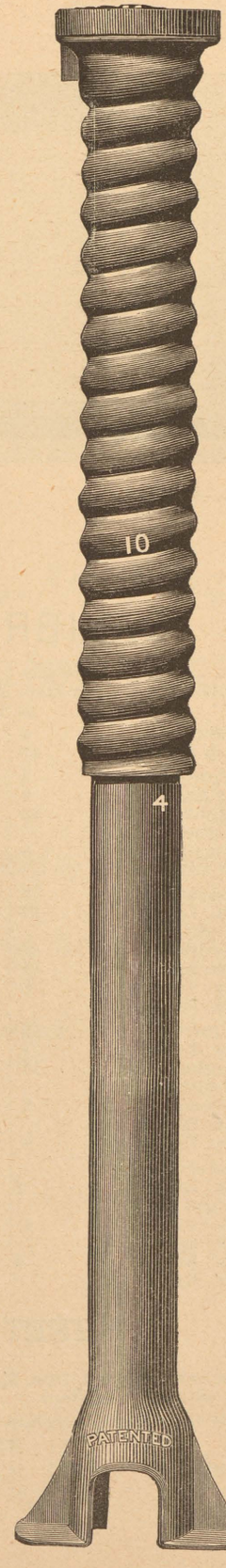
This Box has been thoroughly tested and adopted by several large Cities, both East and West, and is acknowledged to be the BEST IN USE for the purpose required.

SERVICE BOX.

	Ft.	*In.*		*Ft.*	*In.*	*Price.*
From	1	1½	to	1	10½	$1.25
"	2		to	3	3	1.50
"	2	7	to	3	10	1.60
"	2	10	to	4	10	1.75
"	3	5	to	5	6	1.85
"	4	1	to	6	2	2.00

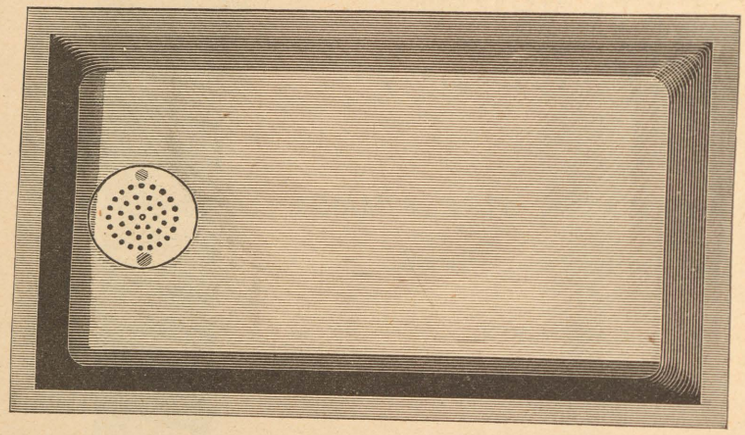
NET PRICES.

Fig. 341.



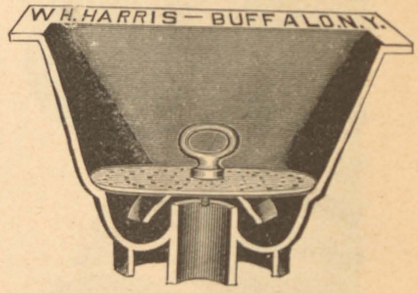
IRON SINKS.

Fig. 342.



14x20, 5 inches deep	$ 2 20	18x30, 5 inches deep	$ 3 50
16x24, 6 " "	2 70	18x30, 6 " "	3 75
18x24, 6 " "	2 80	20x30, 5 " "	3 75
16x28, 6 " "	3 20	20x30, 6 " "	4 00
16x30, 6 " "	3 50	18x32, 6 " "	4 25
17x30, 5 " "	3 60	18x36, 6 " "	4 75

Fig. 343.



HARRIS' SLOP SINK.

20x36, 6 inches deep	$ 5 25
20x40, 6 " "	6 60
12x12, Harris' Slop Sink	2 00
14x14, " " "	2 25
16x16, " " "	2 50

CALIBRE AND WEIGHTS OF LEAD PIPE.

CALIBRE.	Weight per Foot. lbs.	oz.	Average Length of Coil in ft.
¼ inch Tubing		6	
Fish Seine		15	
⅜ inch Aqueduct		8	175
Ex. Light		9	155
Light		12	235
Medium	1		175
Strong	1	8	120
Ex. Strong	2		90
½ inch Aqueduct		10	140
Ex. Light		12	235
Light	1		175
Medium	1	4	140
Strong	1	12	100
Ex. Strong	2	8	70
Ex. Ex. do	3		60
⅝ inch Aqueduct		12	100
Ex. Light	1	4	140
Light	1	12	100
Medium	2		85
Strong	2	8	70
Ex. Strong	3		58
Ex. Ex. do	3	8	50
¾ inch Aqueduct	1		85
Ex. Light	1	8	115
Light	2		85
Medium	2	4	75
Strong	3		58
Ex. Strong	3	8	48
Ex. Ex. do	4		44
⅞ inch Aqueduct	1	8	55
Ex. Light	2		85
Light	2	8	70
1 inch Aqueduct	1	8	55
Ex. Light	2		85
Light	2	8	70
Medium	3	4	53
Strong	4		43
Ex. Strong	4	12	35
Ex. Ex. do	5	8	30
1¼ inch Aqueduct	2		42
Ex. Light	2	8	70
Light	3		55
Medium	3	12	48
Strong	4	12	35
Ex. Strong	6		28
Ex. Ex. do	6	12	24
1½ inch Aqueduct	3		28
Ex. Light	3	8	42
Light	4		40
Medium	5		32
Strong	6		36
Ex. Strong	7	8	20
Ex. Ex. do	9		17
1¾ inch Ex. Light	3	12	40
Light	4	8	35
Medium	5	8	28
Strong	6	8	23
Ex. Strong	8		20
2 inch Waste	3		11
Ex. Light	4		40
Light	5		30
Medium	7		22
Strong	8		18
Ex. Strong	9		16
Ex. Ex. do	10	8	15
2½ inch Waste	4		12
Light	6		12
3-16 thick	8		12
¼ thick	11		12
5-16 thick	14		12
⅜ thick	17		12
3 inch Waste	3		12
Light	5		12
3-16 thick	9		12
¼ thick	12		12
5-16 thick	16		12
⅜ thick	20		12
3½ inch Waste	5		12
¼ thick	15		12
5-16 thick	18		12
4 inch Waste	5		12
¼ thick	16		12
5-16 thick	21		12
⅜ thick	25		12
4½ inch Waste	6		12
5 inch Waste	8		12

SHEET LEAD.

We have weights, from 2½ lbs. per sq. foot, upwards. Sheets average 7½x20 feet.

1–16 inch thick, weighs 4 lbs per sq. foot.

⅛	"	"	"	7½	"	"
3-16	"	"	"	11	"	"
¼	"	"	"	15	"	"

PURE BLOCK TIN PIPE.

¼ inch.	lbs. 4 oz.	lbs. 4¾ oz.	1 inch.	lbs.	14 oz.
⅜ "	6 "	8 "	1¼ "	1	4
½ "	6 "	8 "	1½ "	1	8
⅝ "	10 "	1	2 "	3	
¾ "	12 "	1 4 "			

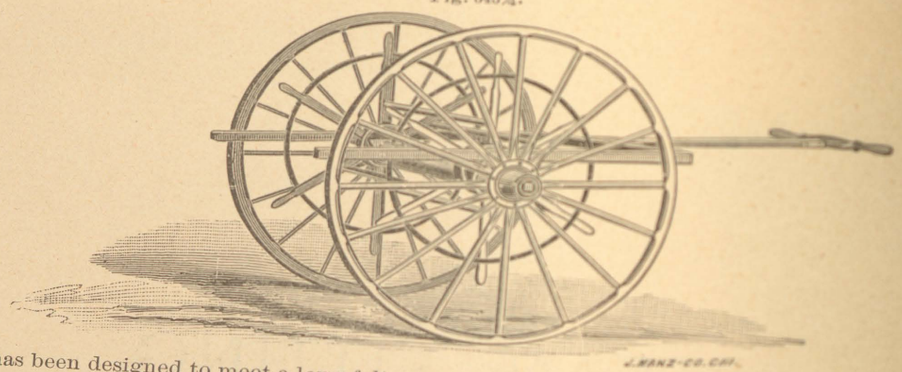
STEAM FITTING.

We have recently put in Machinery for Cutting, Threading and Fitting all sizes of Pipe, up to and including ~~four~~ SIX inches inside diameter.

Having a complete stock of Fittings, Brass Goods, &c., we are prepared to do all kinds of Job Work in this line, and can furnish estimates upon such work when required.

MILL HOSE CARRIAGE.—PORTABLE.

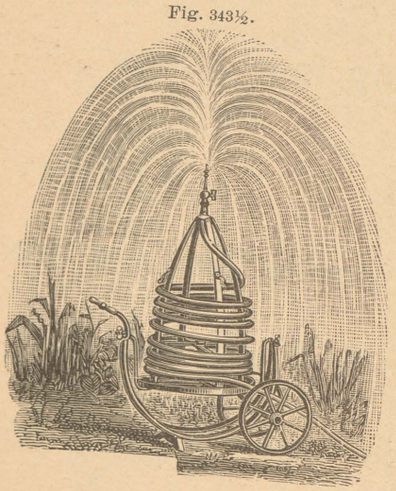
Fig. 343¼.



This Carriage has been designed to meet a long felt want, for a strong, portable vehicle, for conveying hose for mill purposes. The price brings it within the reach of all. It has a strong wooden frame, thoroughly braced with iron, and so constructed that the frame tilts up out of the way, when at rest, thus occupying the least possible space. A strong iron shaft extends across through the drum and is firmly bolted to the sides of the frame, constituting an efficient brace, so that the rear may be left open to allow free access to the reel.

It will carry 250 feet Rubber Hose and 500 feet Linen Hose. Price, $30.00 each, net.

Fig. 343½.



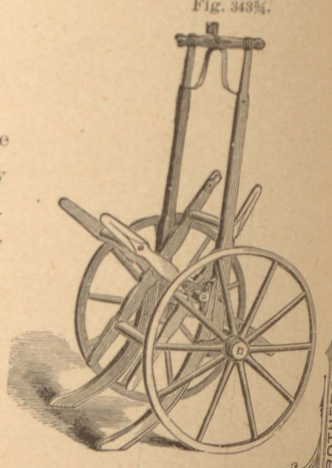
CONICAL HOSE REEL No. 2.

This Reel has several important features. It is so pivoted in the carriage frame that it can be tilted to the right or left, and fixed at any angle from a perpendicular to a horizontal position. The nozzle is fixed at the apex of the Conical Reel, in line with its axis, so that it can be moved from one place to another, paying out or taking up the hose while the nozzle is playing, without changing the direction of flow.

It is not necessary to handle the nozzle or touch the hose while using it. When coiled up with the Reel at rest upright, the hose inclines gradually downward from nozzle to butt, and naturally drains itself—a feature possessed by no other Reel. It is capable of carrying 100 feet of Hose. Price, $4.50 each.

FOUNTAIN HOSE REEL.—Nos. 3 and 4.

Fig. 343¾.



The No. 3 Reel carries 150 feet of Hose. The No. 4, 200 feet.

In ordinary use it is not necessary to remove the nozzle from the Reel, or handle the hose, either when reeling off or on when in operation, as the Reel can be fastened by a thumb screw, so as to poise the nozzle to the required angle, but it can be readily detached and placed in the clasp at the top of the standard and reset as a fountain, if desired.

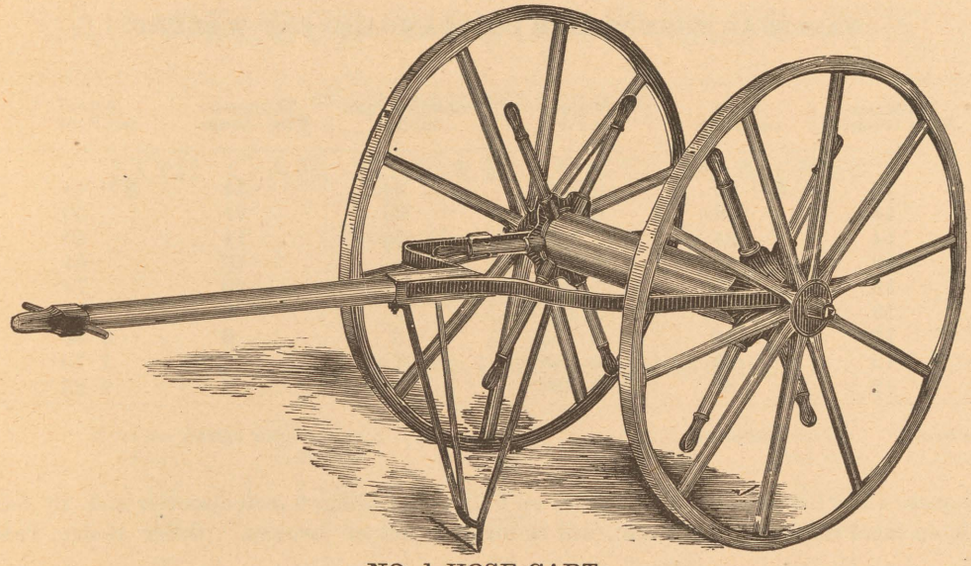
It will pay for itself in one season, by preserving the hose, and is always ready for use.

Price, No. 3, ... $5 00 each.

" No. 4, ... 9 00 "

HOSE REELS.

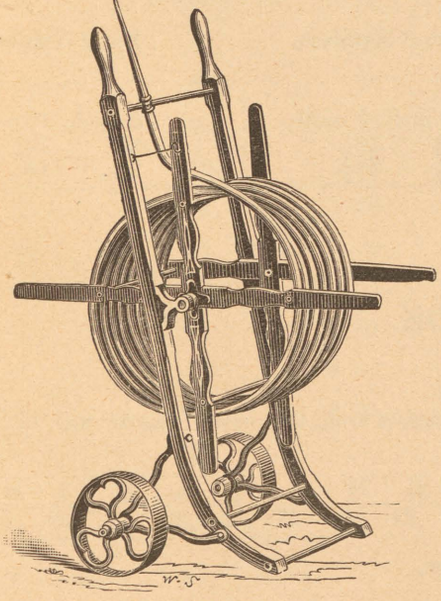
Fig. 344.



NO. 1 HOSE CART.

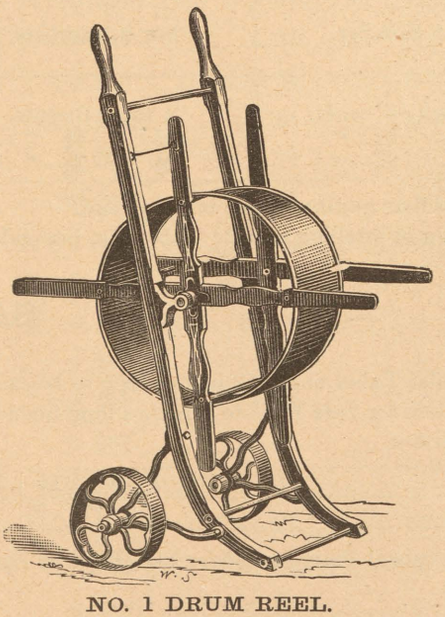
No. 1, as shown in the cut is not fairly illustrated. It is symmetrical in build, pretty in appearance as well as useful about Lawns, Hotels, etc. It has strong wheels 30 inches in diameter, ¾ inch Tire, Iron Hubs, inch Axle. It has many merits and is far preferable to anything of the kind in the market. Will carry 250 feet of ¾ inch Hose. Price, each, $6.00.

Fig 345.



NO. 1 REEL.

Fig. 346.



NO. 1 DRUM REEL.

The above Reels are the latest improved; Bent Side Pieces, and are the strongest and best in market. They stand much firmer upon the ground than any other. The Wheels are 8 and 13 inches. No Castings that are liable to break. The Reel is very large, enabling Hose to be used when partly wound up, protecting it from injury and allowing water to pass through freely. Can be knocked down for shipping.

No. 1 Reel—To carry from 50 to 100 feet ¾ Hose, 8 inch Wheels, ... $3 50
No. 2 Reel—To carry from 100 to 150 feet ¾ Hose, 12 inch Wheel, ... 4 25
No. 1 Reel—With Iron Drum on Reel, 8 inch Wheels. 4 25
No. 2 Reel—With Iron Drum on Reel, 12 inch Wheels, ... 5 50

IRON BOILER TUBES.

NATIONAL TUBE WORKS CO. STANDARD LAP WELDED.

Outside Diam. Inches.	Thickness Wire Gauge.	Price per Foot.	Weight per Foot.	Outside Diam. Inches.	Thickness Wire Gauge.	Price per Foot.	Weight per Foot.
1	15	$ 0 26	0.708	3¼	11	$ 0 44	3.958
1¼	15	26	0.9	3½	11	50	4.272
1½	14	25	1.250	3¾	11	56	4.590
1¾	13	25	1.665	4	10	64	5.320
2	13	25	1.981	4½	10	74	6.010
2¼	13	29	2.238	5	9	90	7.226
2½	12	32	2.755	6	8	1 30	9.346
2¾	12	35	3.045	7	8	1 70	12.435
3	12	38	3.333	8	8	2 25	15.109

Discount..... ...per cent.

Extra Lengths.—The list prices cover all tubes up to, and including, 8 inch diameter and 20 feet long. For over that length, an extra charge of 10 per cent. will be made on net of invoices. Order Boiler Tubes by *outside* measurement.

Net Prices of Extra Wire Gauge of Boiler Tubes away from standard.—Not exceeding four wire gauges, add 1½ cents for each inch in diameter to the list price per foot for each additional number. To calculate price, take discounts from list prices of regular Tubes, and add net charge for extra wire gauge:

For 1 Number.	For 2 Numbers.	For 3 Numbers.	For 4 Numbers.
2 inch, 3 cents.	2 inch, 6 cents.	2 inch, 9 cents.	2 inch, 12 cents.
2¼ " 3⅜ "	2¼ " 6¾ "	2¼ " 10⅛ "	2¼ " 13½ "
2½ " 3¾ "	2½ " 7½ "	2½ " 11¼ "	2½ " 15 "

Beyond four numbers price is per pound.

Swaging or swelling 2 or 2¼ Tubes, 5c. per end extra.

SAFE ENDS.

All Boiler Tubes under 12 inches long to be called Safe Ends.

Net prices for Safe Ends to 6 inches long inclusive. Over 6 inches long, the extra length will be charged in same proportion.

Size.....	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4½	5	6
Each End.....	.17	.17	.17	.17	.17	.19	.21	.24	.27	.30	.33	.36	.39	.43	.50	.61

No additional charge made for Safe Ends of Extra Wire Gauge.

SEMI-STEEL LOCOMOTIVE BOILER TUBES OF EXTRA GAUGE.

Outside Diameter, Inches.....	1	1¼	1½	1¾	2	2¼	2½	2¾	3
Wire Gauge.....	14	14	13	12	12	12	12	11	11
Price per foot.....	.35	.34	.33	.32	.32	.35	.38	.42	.45

LAP WELDED WROUGHT IRON PIPE,

PLAIN AND GALVANIZED,

FOR GAS, STEAM AND WATER.

Revised November 23d, 1880.

TABLE OF STANDARD DIMENSIONS AND SIZES.

Size. Inches.	*Price per Foot Plain.* $ Cts.	*Price per Foot Galvanized.* $ Cts.	*Actual Outside Diameter.* Inches.	*Thickness.* Inches.	*Weight Per Foot.* Pounds.	*Threads to Inch of Screw.*
$\frac{1}{8}$	08		0.405	0.068	0.24	
$\frac{1}{4}$	08	11	0.54	0.088	0.42	18
$\frac{3}{8}$	09	12	0.675	0.091	0.56	18
$\frac{1}{2}$	11	15	0.84	0.109	0.85	14
$\frac{3}{4}$	13$\frac{1}{2}$	19	1.05	0.113	1.12	14
1	19	28	1.315	0.134	1.67	11$\frac{1}{2}$
1$\frac{1}{4}$	27	40	1.66	0.140	2.25	11$\frac{1}{2}$
1$\frac{1}{2}$	33	47	1.9	0.145	2.69	11$\frac{1}{2}$
2	46	64	2.375	0.154	3.66	11$\frac{1}{2}$
2$\frac{1}{2}$	75	1 00	2.875	0.204	5.77	8
3	95	1 30	3.5	0.217	7.54	8
3$\frac{1}{2}$	1 25	1 70	4.0	0.226	9.05	8
4	1 50	2 05	4.5	0.237	10.72	8
4$\frac{1}{2}$	1 75	2 40	5.0	0.247	12.49	8
5	2 25	3 00	5.563	0.259	14.56	8
6	2 75	4 00	6.625	0.280	18.76	8
7	3 75		7.625	0.301	23.41	8
8	4 75		8.625	0.322	28.34	8
9	6 50		9.68	0.344	34.07	8
10	8 00		10.75	0.366	40.64	8
12	12 00		13.00	0.410	54.65	8

Subject to change without notice. For Code for Ordering by Telegraph see next Page.

Order Wrought Iron Pipe by INSIDE MEASUREMENT.

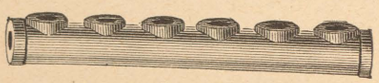
TELEGRAPH CODE FOR WROUGHT IRON PIPE.

NUMBER OF FEET.		SIZE.	BLACK.	GALVANIZED.
25.	Africa.	$\frac{1}{8}$	Allegheny.	
50.	Alabama.	$\frac{1}{4}$	Baltimore.	Amazon.
75.	Cuba.	$\frac{3}{8}$	Camden.	Bay.
100.	Asia.	$\frac{1}{2}$	Detroit.	Colorado.
200.	Belgium.	$\frac{3}{4}$	Erie.	Danube.
300.	Chili.	1	Fairmount.	Elbe.
400.	Denmark.	$1\frac{1}{4}$	Galena.	Firth.
500.	Egypt.	$1\frac{1}{2}$	Harrisburg.	Ganges.
600.	France.	2	Ithaca.	Hudson.
700.	Germany.	$2\frac{1}{2}$	Jamestown.	Indus.
800.	Holland.	3	Kensington.	Juniata.
900.	Ireland.	$3\frac{1}{2}$	Lancaster.	Kanawha.
1000.	Japan.	4	Macon.	Lake.
2000.	Kentucky.	$4\frac{1}{2}$	Quincy.	Miami.
3000.	Liberia.	5	Newark.	Nile.
4000.	Maine.	6	Oneida.	Osage.
5000.	Nevada.	7	Paris.	Po.
6000.	Ohio.	8	Reading.	Rhine.
7000.	Peru.	9	Salem.	Seine.
8000.	Russia.	10	Troy.	Tweed.
9000.	Spain.			
10000.	Texas.			

Walnut, ship by Steamer; Hickory, ship by Railroad; Oak, ship by Express.

BRANCH TEES.

Fig. 347.

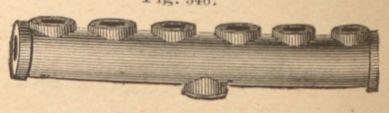


Plain.

Fig. 348.

Side Outlet.

Fig. 346.



Back Outlet.

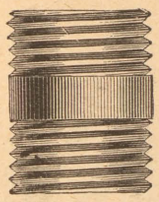
No. of Outlets,	2	3	4	5	6	7	8	9	10	12
$\frac{3}{4}$ Outlets, 2 cen. to cen., 1 in. or $1\frac{1}{4}$ run,	50	55	65	70	80	$1 00	$1 20	$1 40	$1 70	.....
$\frac{3}{4}$ Outlets, 2 cen. to cen., $1\frac{1}{2}$ in run,	55	65	80	95	$1 10	1 25	1 40	1 60	1 90	.....
1 Outlets, $2\frac{1}{2}$ cen. to cen., 1 in. or $1\frac{1}{4}$ run,	70	75	80	90	1 00	1 20	1 40	1 60	1 80	.....
1 Outlets, $2\frac{1}{2}$ cen. to cen., $1\frac{1}{2}$ in run,	75	80	90	$1 00	1 20	1 45	1 70	1 95	2 20	.....
1 Outlets, $2\frac{1}{2}$ cen. to cen., 2 in. run,	80	85	95	1 15	1 40	1 70	2 00	2 30	2 60	$4 00
$1\frac{1}{4}$ Outlets, 3 cen. to cen., $1\frac{1}{2}$ in. run,	$1 10	$1 15	$1 20	1 35	1 50	1 80	2 10	2 40	2 75	3 10
$1\frac{1}{4}$ Outlets, 3 cen. to cen., 2 in. run,	1 40	1 50	1 60	1 80	2 00	2 30	2 60	2 90	3 25	3 60
$1\frac{1}{2}$ Outlets, $3\frac{1}{2}$ cen. to cen., 2 in. run,	1 75	1 85	2 00	2 20	2 40	2 70	3 00	3 30	3 65	4 00

Back or Side Outlets charged as additional Front Outlets.

In ordering, be particular to state size of Run required. When not ordered otherwise, all Openings will be tapped Right Hand.

FITTINGS.

Fig. 350.



Shoulder.

Fig. 351.

Long.

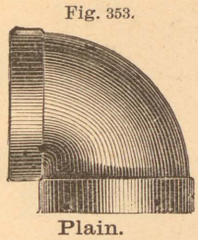
Fig. 352.

Close.

NIPPLES.

Pipe Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Shoulder or Close	5	6	7	9	.10	.14	.17	.25	.56	.75	1.00	1.25	1.75	2.00	2.75	4.00	5.75
Long	7	9	.10	.11	.15	.20	.25	.35	.75	.95	1.25	1.60	2.25	2 60	3.60	...	....
Shoulder or Close, R. & L.	.10	.10	.12	.15	.18	.24	.30	.40	1.00	1.25	....	....	....	....	....	....	....

Fig. 353.

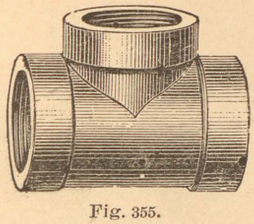


Plain.

ELBOWS (Malleable Iron).

Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price	4	4	5	6	9	.16	.23	.32	.50	.75	1.40	2.05	2.80

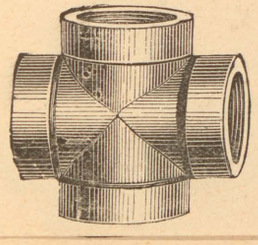
Fig. 354.



TEES (Malleable Iron).

Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price	5	5	6	8	.12	.19	.26	.40	.60	1.00	1.60	2.40	3.20

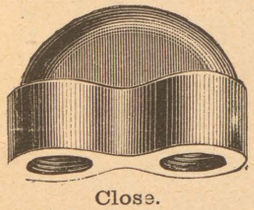
Fig. 355.



CROSSES (Malleable Iron).

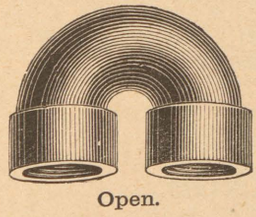
Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Price	7	7	7	.10	.17	.26	.35	.54	.80	1.70	2.60	....	3.75

Fig. 356.



Close.

Fig. 357.

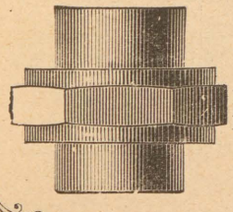


Open.

RETURN BENDS.

Pipe Size	¾	1	1¼	1½	2	2½	3
Close	.14	.18	.28	.40	.55	1.50	2.25
Open	.19	.26	.44	.64	1.00	1.75	2.50

Fig. 358.

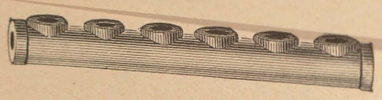


UNIONS.

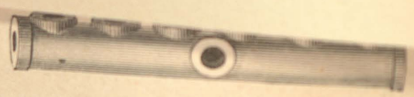
Pipe Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price	.14	.16	.19	.23	.28	.38	.48	.72	1.35	2.10

TELEGRAPH CODE FOR WROUGHT IRON PIPE.

NUMBER OF FEET.		SIZE.	BLACK.	GALVANIZED.
25.	Africa.	$\frac{1}{8}$	Allegheny.	
50.	Alabama.	$\frac{1}{4}$	Baltimore.	Amazon.
75.	Cuba.	$\frac{3}{8}$	Camden.	Bay.
100.	Asia.	$\frac{1}{2}$	Detroit.	Colorado.
200.	Belgium.	$\frac{3}{4}$	Erie.	Danube.
300.	Chili.	1	Fairmount.	Elbe.
400.	Denmark.	$1\frac{1}{4}$	Galena.	Firth.
500.	Egypt.	$1\frac{1}{2}$	Harrisburg.	Ganges.



Plain.



Side Outlet.

Back Outlet.

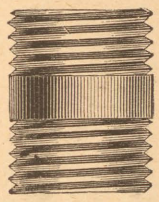
No. of Outlets,	2	3	4	5	6	7	8	9	10	11
$\frac{3}{4}$ Outlets, 2 cen. to cen., 1 in. or $1\frac{1}{4}$ run,	50	55	65	70	80	$1 00	$1 20	$1 40	$1 70	..
$\frac{3}{4}$ Outlets, 2 cen. to cen., $1\frac{1}{2}$ in run,	55	65	80	95	$1 10	1 25	1 40	1 60	1 90	..
1 Outlets, $2\frac{1}{2}$ cen. to cen., 1 in. or $1\frac{1}{4}$ run,	70	75	80	90	1 00	1 20	1 40	1 60	1 80	..
1 Outlets, $2\frac{1}{2}$ cen. to cen., $1\frac{1}{2}$ in run,	75	80	90	$1 00	1 20	1 45	1 70	1 95	2 20	..
$1\frac{1}{4}$ Outlets, 3 cen. to cen., 2 in. run,	80	85	95	1 15	1 40	1 70	2 00	2 30	2 60	$2
$1\frac{1}{4}$ Outlets, 3 cen. to cen., $1\frac{1}{2}$ in. run,	$1 10	$1 15	$1 20	1 35	1 50	1 80	2 10	2 40	2 75	3
$1\frac{1}{2}$ Outlets, $3\frac{1}{2}$ cen. to cen., 2 in. run,	1 40	1 50	1 60	1 80	2 00	2 30	2 60	2 90	3 25	3
	1 75	1 85	2 00	2 20	2 40	2 70	3 00	3 30	3 65	4

Back or Side Outlets charged as additional Front Outlets.

In ordering, be particular to state size of Run required. When not ordered otherwise, all Openings will be tapped Right Hand.

FITTINGS.

Fig. 350.



Shoulder.

Fig. 351.

Long.

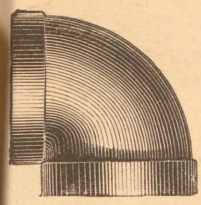
Fig. 352.

Close.

NIPPLES.

Pipe Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Shoulder or Close	5	6	7	9	.10	.14	.17	.25	.56	.75	1.00	1.25	1.75	2.00	2.75	4.00	5.75
Long	7	9	.10	.11	.15	.20	.25	.35	.75	.95	1.25	1.60	2.25	2 60	3.60	...	....
Shoulder or Close, R. & L.	.10	.10	.12	.15	.18	.24	.30	.40	1.00	1.25	....	....	....	....	....	....	....

Fig. 353.



Plain.

ELBOWS. (CAST IRON.)

Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10	12
Price	4	4	4	5	8	.11	.15	.21	.30	.60	.90	1.20	1.60	2.00	2.50	3.50	7.00	10.00	17.00	30.00

Fig. 354.

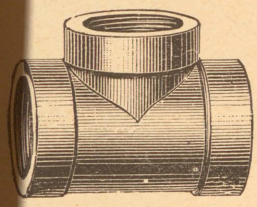


Fig. 355.

TEES. (CAST IRON.)

Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10	12
Price	6	6	6	8	.12	.16	.22	.31	.45	.90	1.35	1.80	2.40	3.00	3.75	5.25	10.00	15.00	25.00	45.00

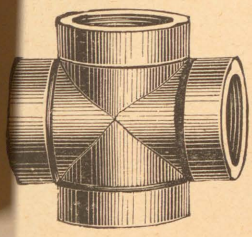
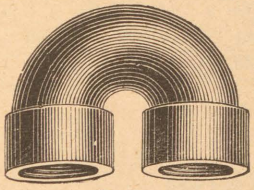


Fig. 356.

CROSSES. (CAST IRON.)

Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10
Price	7	7	7	.11	.15	.20	.30	.42	.60	1.20	1.80	2.40	3.20	4.50	5.00	7.00	14.00	20.00	34.00

Fig. 357.

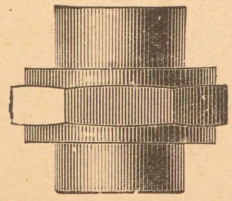


Open.

RETURN BENDS.

Pipe Size	¾	1	1¼	1½	2	2½	3
Close	.14	.18	.28	.40	.55	1.50	2.25
Open	.19	.26	.44	.64	1.00	1.75	2.50

Fig. 358.



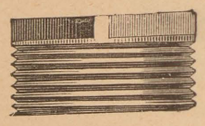
UNIONS.

Pipe Size	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price	.14	.16	.19	.23	.28	.38	.48	.72	1.35	2.10

FITTINGS.

BUSHING.

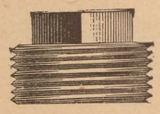
Fig. 359.



Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Price	5	6	7	8	10	14	20	30	45	60	80	1 00	1 30	1 90	2 75	3 50		

PLUG.

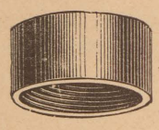
Fig. 360.



Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Price	3	3	4	5	6	8	11	16	25	45	60	80	1 00	1 30	1 90	2 75	3 50	

CAPS.

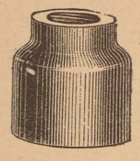
Fig. 361.



Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Price	3	3	5	8	11	15	22	30	45	65	85	1 15	1 60	1 75	2 30	3 00	3 50	

REDUCERS.

Fig. 362.

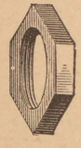


Pipe Size	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Price	4	6	10	15	21	28	44	64	1 00	1 50	2 00	2 75	3 00	4 00	5 00	6 00

LOCKNUTS.

Fig. 363.

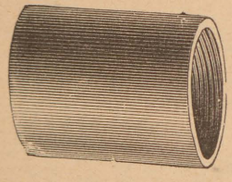
Fig. 364.



Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price	3	3	4	5	6	8	11	16	25	45	60	80	1 00	1 30	1 90	2 75

COUPLINGS.

Fig. 365.



Pipe Size	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8
Price	5	5	6	7	10	13	17	21	28	40	60	80	1 00	1 50	1 65	2 40	3 00	3 50
Right and Left		3	4	6	10	15	21	28	44									

GALVANIZED FITTINGS.

Size of Pipe	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	7	8
Elbows	6	8	12	22	32	45	72	1 10	2 10	3 10	4 10	7 00	11 00	15 00	19 00
Tees	7	10	16	26	36	56	86	1 40	2 40	3 50	4 60	8 00	12 00	17 00	22 00
Crosses	8	12	22	35	48	70	1 10	2 00	3 00	5 00	6 50	10 00	16 00	22 00	28 00
Couplings	8	10	13	18	25	32	40	55	80	1 65	1 40	2 25	3 25		
Nipples	8	9	11	13	17	23	32	65	75	1 00	1 40	2 40	3 50		
Unions	22	26	34	42	55	70	1 04	1 80	2 80						

MALLEABLE IRON FITTINGS.

Revised Price List and Classification of Malleable Iron Fittings, adopted by Manufacturers, March 1st, 1883.

CLASS A. Price, 20 cents per pound.

Elbows, $\frac{1}{8}$, $\frac{1}{4}$ x $\frac{1}{8}$, $\frac{3}{8}$ x $\frac{1}{8}$.
Tees, $\frac{1}{8}$, $\frac{1}{8}$ x $\frac{1}{4}$, $\frac{1}{4}$ x $\frac{1}{8}$, $\frac{3}{8}$ x $\frac{1}{8}$.
Reducing Couplings, $\frac{1}{4}$ x $\frac{1}{8}$, $\frac{3}{8}$ x $\frac{1}{8}$.
Couplings, R. H., $\frac{1}{8}$.

CLASS B. Price, 13 cents per pound.

Elbows and Tees, $\frac{1}{4}$ inch to $\frac{1}{2}$ x $\frac{3}{8}$, inclusive.
Street Elbows, $\frac{1}{2}$, $\frac{3}{4}$, 1.
Elbows, side outlets, all sizes.
Crosses, $\frac{1}{4}$ inch to 1 inch, inclusive.
Drop L's and Drop Tees, all sizes.
Caps, Plugs and Locknuts, $\frac{1}{4}$ to 1 inch, inclusive.
Reducing Couplings, $\frac{3}{8}$ x $\frac{1}{4}$ to 1 x $\frac{3}{4}$, inclusive.
Extension Pieces.
R. and L. Couplings, $\frac{1}{4}$ to $\frac{3}{4}$, inclusive.
R. H. Couplings, $\frac{1}{4}$ and $\frac{3}{8}$.
Waste Nuts.
Chandelier Hooks.
Return Bends, $\frac{3}{4}$ and smaller.

CLASS C. Price, 10½ cents per pound.

Elbows and Tees, $\frac{1}{2}$, $\frac{3}{4}$ and 1.
Street Elbows, 1$\frac{1}{4}$ x 1 and larger.
Crosses, 1$\frac{1}{4}$ x 1 x $\frac{3}{4}$ and larger.
Caps, Plugs and Locknuts, 1$\frac{1}{4}$ and larger.
Reducing Couplings, 1$\frac{1}{4}$ x $\frac{1}{2}$ and larger.
R. and L. Couplings, 1 and larger.
R. H. Couplings, $\frac{1}{2}$, $\frac{3}{4}$ and 1.
Straps, (not tinned), all sizes.
Return Bends, 1 inch and larger.

CLASS D. Price, 9 cents per pound.

Elbows, 1$\frac{1}{4}$ x 1 and larger.
Tees, 1$\frac{1}{4}$ x $\frac{3}{8}$ x 1 and larger.
R. H. Couplings, 1$\frac{1}{4}$ and larger.

Galvanized and Tinned Fittings, 5 cents per pound extra.
Enameled Fittings, 8 cents per pound extra.

CAST IRON REDUCING FITTINGS.

TO THE TRADE.

The Manufacturers of Cast Iron Elbows, Tees and Crosses, have found it necessary to increase the List.

We therefore notify you that the following will be the List Prices, subject to the same discount as regular Cast Iron Fittings.

REDUCING ELBOWS.

Size, inch,	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each,	.05	.05	.07	.10	.14	.19	.27	.38	.75	$1.12
Size, inch,	3½	4	4½	5	6					
Price, each,	$1.50	$2.00	$2.50	$3.00	$4.20					

REDUCING TEES.

Size, inch,	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each,	.08	.08	.11	.15	.21	.29	.40	.57	$1.12	$1.68
Size, inch,	3½	4	4½	5	6					
Price, each,	$2.25	$3.00	$3.75	$4.50	$6.30					

REDUCING CROSSES.

Size, inch,	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each,	.10	.10	.14	.20	.28	.38	.54	.76	$1.50	$2.24
Size, inch,	3½	4	4½	5	6					
Price, each,	$3.00	$4.00	$5 00	$6.00	$8.40					

It will be observed that the List Prices of Reducing Fittings above six inches remain as heretofore.

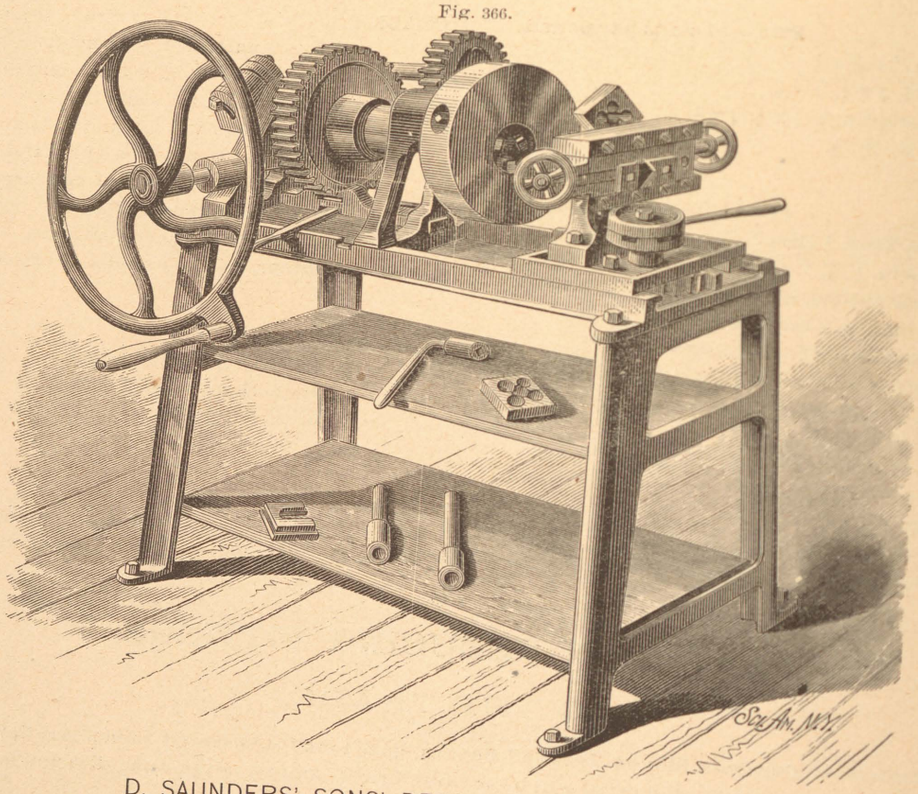
Right and Left and Left Hand Fittings will be charged 25 per cent. more than Right Hand Fittings.

IXL PIPE CUTTING AND THREADING MACHINE.

D. SAUNDERS' SONS' NEW IMPROVED.

PATENTED MAY 28, 1878.

Fig. 366.



D. SAUNDERS' SONS' DESCRIPTION OF THE IXL.

This Machine is simple in construction, easy to work, not liable to get out of order, and requires no skilled labor.

The arrangement of the Gearing permits the Machine being adjusted to the work to be done, enabling one man to screw two-inch pipe with ease. There are THREE CHANGES OF SPEED. The fast speed cuts ¼, ⅜ and ½; the next, ¾, 1 and 1¼ inches; and the slowest, 1½ and 2 inches. The changes are made by the movement of the Lever in front of the Machine.

The Patent Concentric Gripping Chuck is of substantial construction, having three Jaws moved to the centre by one Screw—centering the Pipe true. It has not its equal as a Chuck for gripping Pipe for general use.

The Machine is provided with a novel Chuck on the back end of the Spindle, for entering the Pipe, doing away with Guides. The Die Head is arranged with cutting off Tool Slide, and self-centering Jaws, for steadying the Pipe while being cut off. The Die Starter is the long lever-working pinion in the rack at the bottom of the Die Head. It is a portable Machine, weighing about four hundred pounds.

Crooked Threads can not be cut, as the Pipe revolves and the Die stands still. There are no loose Guides to be changed or lost. The Machine can be easily arranged to operate by belt power when desirable.

The system adopted in the manufacture of these Machines enables us to readily duplicate parts requiring renewal, and to fit them up in a manner superior to most machines of this kind. It also permits us to offer them AT A PRICE WITHIN THE REACH OF ALL, and very little in excess of the cost of a set of Stocks and Dies cutting the same range of sizes, with the necessary Cutting Off Tools and Pipe Vise—all of which it will to a great extent supersede, especially in the shop or on a job of some extent. It is also an excellent Machine for Machine and Jobbing Shops, for cutting off Round Iron and Steel, and with the Bolt Threading and Nut Tapping Attachment it makes a very good Bolt Threader and Nut Tapper.

HAND MACHINE—With set of Dies ¼ to 2 inches inclusive, Fly Wheel, and set of Sockets for making Nipples ¼ to 2 inches, complete, $90.

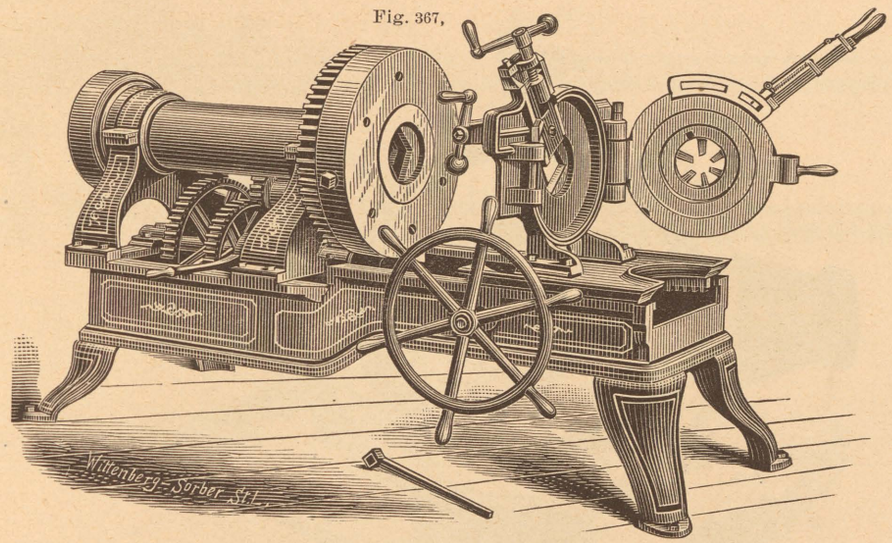
POWER AND HAND MACHINE—With set of Dies ¼ to 2 inches inclusive, Fly Wheels, Pulleys, Countershaft, and set of Sockets for making Nipples ¼ to 2 inches, complete. $110.

Speed of Countershaft, 150 revolutions per minute; Pulleys, 11 inches in diameter.

Attachments fitted to these Machines when ordered, for Threading Bolts and Tapping Nuts 1¼ inches, and smaller sizes, at an additional cost.

PEERLESS PIPE AND BOLT MACHINE.

Fig. 367,



The No. 2 Machine cuts Pipe from ¼ to 2 inches, and Bolts from ½ to 1¼. The No. 3 Machine cuts Pipe from ¼ to 3 inches, and Bolts from ½ to 1½. The No. 4 Machine cuts Pipe from 1 to 4 inches. The No. 6 Machine cuts Pipe from 2½ to 6 inches. The No. 8 Machine cuts Pipe from 2½ to 8 inches. The No. 12 Machine cuts Pipe from 4 to 12 inches.

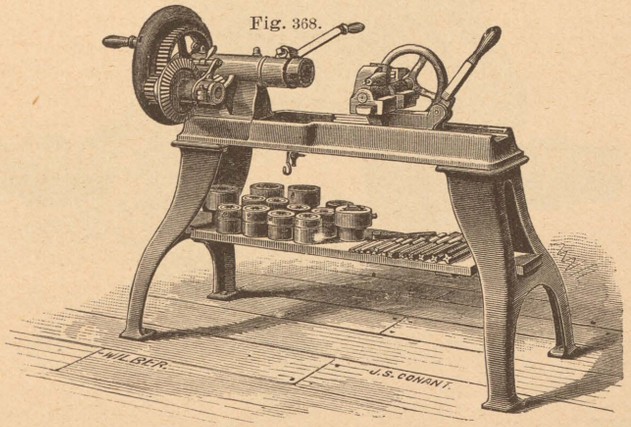
PRICES.

No. 2 A, Pipe Cutting and Threading only, solid Dies,	$175 00
No. 2 B, Pipe Cutting and Threading only, Patent Dies, ¼ to 1, open 1¼ to 2,	250 00
No. 2 C, Pipe and Bolts combined, solid and open Dies as above for Pipe, open Dies for Bolts,	300 00
No. 3 A, Pipe Cutting and Threading only, solid Dies ¼ to 3 inches inclusive,	300 00
No. 3 B, Pipe Cutting and Threading only, open Dies ¼ to 3 inches inclusive,	350 00
No. 3 C, Pipe and Bolt Machine combined, for Pipe, as in No. 3 B; open Dies for Bolts, ½ to 1½ in. inclusive, by eighths,	425 00

Overhanging Machinery included in above prices. If Countershaft is omitted, $15 less on List of No. 2; $25 on No. 3. Full sets of Dies are included in the price of the Machine. Extra Dies or accompaniments will be charged extra.

BOLT CUTTER, NUT TAPPER AND PIPE THREADER.

Fig. 368.



WILEY & RUSSELL'S NO. 10.

ASSORTMENT 1.—Machine complete, with Taps and Dies (in Collets) for Bolts and Nuts, ¼, 5/16, ⅜, 7/16, ½, ⅝, ¾, ⅞, 1, 1⅛, 1¼, 1⅜ and 1½ inches; complete, with Tap Chuck, Wrenches, etc., $172.25.

ASSORTMENT 2.—Machine complete, with Taps and Dies (in Collets) for Bolts and Nuts, ⅜, 7/16, ½, ⅝, ¾, ⅞ and 1 inch; complete, with Tap Chuck, Wrenches, etc., $125.

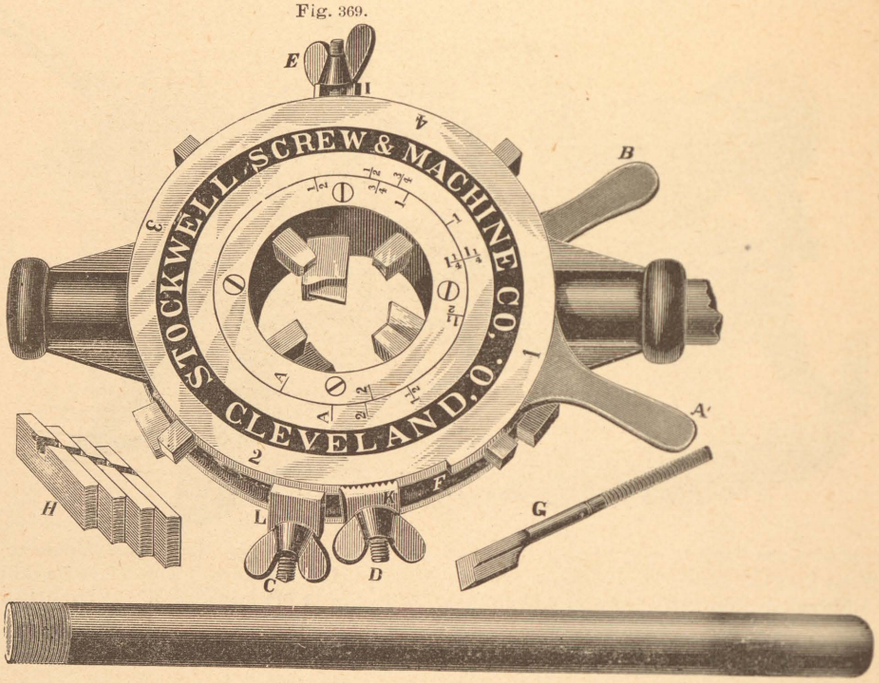
ASSORTMENT 3.—Machine complete, with Dies and Collets for Pipe, R. H., ⅛, ¼, ⅜, ½, ¾, 1, 1¼, 1½ and 2 inches, $160.

Holders supplied for using common Pipe Dies with this Machine, when desired.

When mounted on Iron Legs, $10 extra.

MAGIC SCREW PLATE.

Fig. 369.

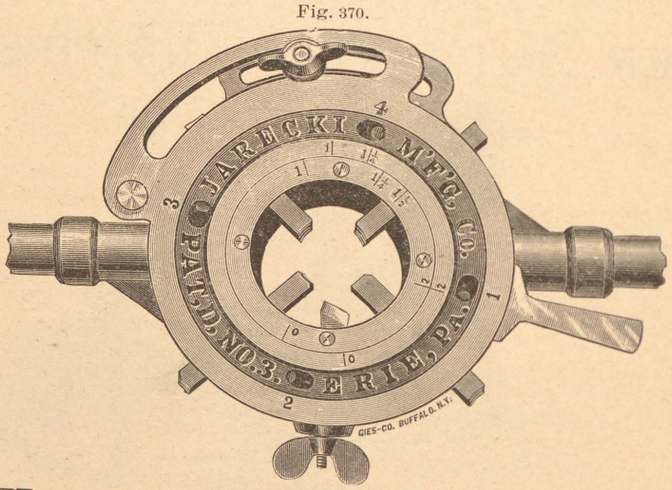


PIPE.

No. 1, with Cut-Off, and dies for threading,	⅛, ¼, ⅜, ½ and ¾	$ 18 00
No. 2, " " " "	¼, ⅜, ½, ¾, 1 and 1¼	20 00
No. 3, " " " "	½, ¾, 1, 1¼, 1½ and 2	25 00
No. 4, " " " "	1½, 2, 2½ and 3	45 00
No. 5, " " " "	2½, 3, 3½ and 4	60 00

Nos. 4 and 5 are provided with four handles. Each Plate requires only one set of dies.

Fig. 370.



PIPE.

No. 1, Cuts and Threads,	¼, ⅜, ½, ¾	$ 14 00
No. 2, " "	½, ¾, 1, 1¼	16 00
No. 3, " "	1, 1¼, 1½, 2	20 00
No. 3½, " "	½, ¾, 1, 1¼, 1½, 2	22 50

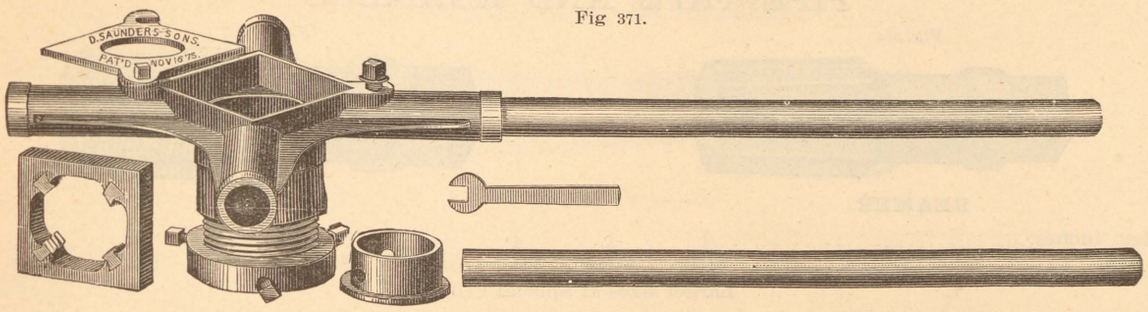
PIPE.

No. 4A, Cuts and Threads,	1½, 2, 2½, 3	$ 35 00
No. 4B, " "	2½, 3, 3½, 4	50 00
No. 5, " "	4½, 5, 6	75 00

Number	1	2	3	3½	4A	4B	5
Dies, per set, right or left hand	2 00	2 00	2 00	4 00 (2 sets Dies.)	3 00	3 00	6 00
Knives	40	40	40	50	50	50	1 00

STOCKS AND DIES.

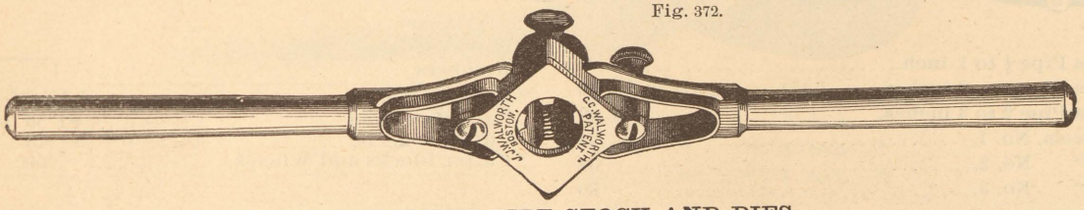
Fig 371.



SAUNDERS' SONS' PIPE STOCK AND DIES.

No. 1 stock, with dies 2 inches sq. by $\frac{1}{2}$ in. to cut $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ inch pipe	$ 6 50
No. $1\frac{1}{2}$ stock, with dies $2\frac{1}{2}$ inches sq. by $\frac{3}{4}$ in. to cut $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch pipe	10 00
No. $2\frac{1}{2}$ " " 3 " " $\frac{3}{4}$ " $\frac{3}{4}$, 1 and $1\frac{1}{4}$ inch pipe	10 00
No. $2\frac{3}{4}$ " " 3 " " $\frac{7}{8}$ " 1, $1\frac{1}{4}$ and $1\frac{1}{2}$ inch pipe	12 00
No. 3 " " 4 " " $\frac{7}{8}$ in., with leader screw, to cut $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inch pipe	15 00
Extra guides for No. 1, 20 cents; No. $1\frac{1}{2}$, 25c; No. $2\frac{1}{2}$, 30c; No. $2\frac{3}{4}$, 40c; No. 3, 50c; No. 4, $1.00; No. 5	1 50
Extra die holders for Nos. $2\frac{1}{2}$ and $2\frac{3}{4}$ stock, outside size 3 in. sq. by $\frac{3}{4}$ in. to hold $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ in. dies, 2 in. sq. by $\frac{1}{2}$ in.	40
Extra die holder for No. 3 stock, outside size 4 in. sq. by 1 in. to hold $\frac{3}{4}$ and 1 in. dies, 3 in. sq. by $\frac{3}{4}$ in.	50

Fig. 372.



WALWORTH'S PIPE STOCK AND DIES.

Numbers	00	0	1	$1\frac{1}{2}$
Pipe Sizes of dies	$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$,	$\frac{1}{2}$, $\frac{3}{4}$, 1,	$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1,	$\frac{3}{4}$, 1, $1\frac{1}{4}$,
Dimensions of dies	$2x\frac{1}{2}$	$2x\frac{5}{8}$	$2\frac{1}{2}x\frac{3}{4}$	$3x\frac{3}{4}$
Comp. with R.H.dies	15 00		15 00	13 50
Stocks only	5 00		5 00	6 00
Ex. dies, R. or L.	2 00		2 00	2 50
Ex. guides	35		35	45
Die frames	30		30	40

Numbers	$1\frac{3}{4}$	2	3
Pipe Sizes of dies	1, $1\frac{1}{4}$, $1\frac{1}{2}$,	$1\frac{1}{4}$, $1\frac{1}{2}$, 2,	$2\frac{1}{2}$, 3,
Dimensions of dies	$3x\frac{3}{4}$	$4x\frac{7}{8}$	$5x1\frac{1}{4}$
Comp. with R.H.dies	13 50	20 00	43 00
Stocks only	6 00	9 50	25 00
Ex. dies, R. or L.	2 50	3 50	9 00
Ex. guides	45	60	1 00
Die frames	40	50	60

☞Nos. 3 and 4 Stocks have Leader Screws.☜

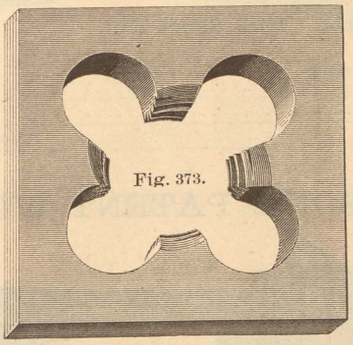


Fig. 373.

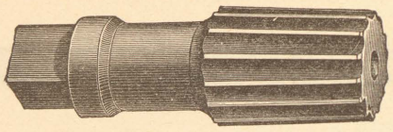
SOLID DIES.—RIGHT OR LEFT.

$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ inch, $1\frac{5}{8}$ inches square by $\frac{1}{2}$ inch, for No. 0 Stock, each	$ 1 00
$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ inch, 2 inches square by $\frac{1}{2}$ inch, for No. 1 Stock, each	1 00
$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 inch, $2\frac{1}{4}$ inches square by $\frac{3}{4}$ inch, for No. 00 Stock, each	1 50
$\frac{1}{2}$, $\frac{3}{4}$, 1 inch, $2\frac{1}{4}$ inches square by $\frac{3}{4}$ inch, for No. $1\frac{1}{2}$ Stock, each	1 50
$\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 inch, $2\frac{1}{2}$ inches square by $\frac{3}{4}$ inch, for Nos. 2 and $2\frac{1}{2}$, each	2 00
$\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$ inch, 3 inches square by $\frac{3}{4}$ inch, for Nos. 2 and $2\frac{1}{2}$, each	2 25
$\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ inch, 3 inches square by $\frac{7}{8}$ inch, for No. $2\frac{3}{4}$ Stock, each	3 00
$\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2 inch, 4 inches square by $\frac{7}{8}$ inch, for No. 3 Stock, each	3 25
$\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, 2 inch, 4 inches square by 1 inch. No 3 Stock, each	10 00
$2\frac{1}{2}$, 3 inch, 5 inches square by $1\frac{1}{4}$ inch, No. 4 Stock	18 00
$3\frac{1}{2}$, 4 inch, $7\frac{1}{2}$ inches octagon by $1\frac{1}{2}$ inch, for No. 5 Stock, each	

The frames of $2\frac{1}{2}$, 3, $3\frac{1}{2}$ and 4 inch dies are of malleable iron, with cutters set in.

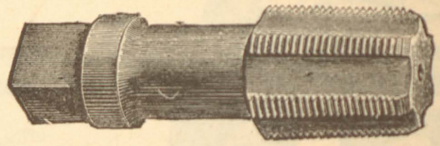
PIPE TAPS AND REAMERS.

Fig. 374.



REAMER.

Fig. 375.



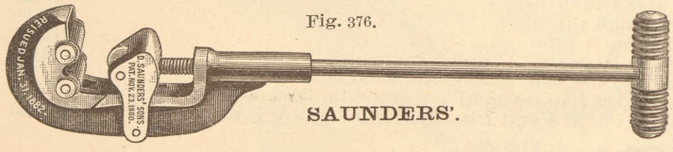
TAP.

Diameter, inches,	⅛	¼	⅜	½	¾	1	1¼	1½	2
Price,	$1.12	$1.25	$1.50	$1.87	$2.50	$3.12	$3.75	$4.62	$6.25

Larger sizes at Special Prices.

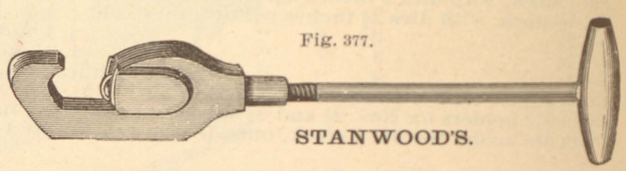
PIPE CUTTERS.

Fig. 376.



SAUNDERS'.

Fig. 377.



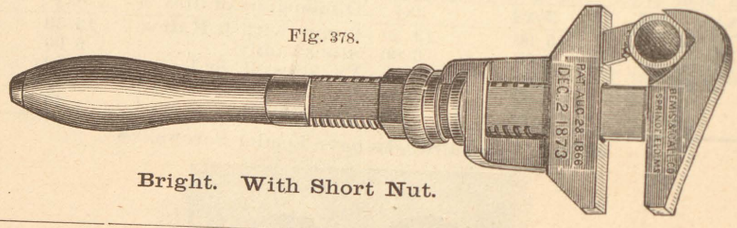
STANWOOD'S.

No. 1, cuts Pipe ⅛ to 1 inch.,	$ 3 00
No. 2, cuts Pipe 1 to 2 inches,	4 50
No. 3, cuts Pipe 2 to 3 inches,	14 00
Extra Wheels, No. 1,	24
" " No. 2,	32
" " No. 3,	60

Numbers,	1	2	3
Cuts Pipe from	⅛ to ¾	1 to 2	2 to 3
Case Hardened,	$1 50	$2 25	$7 00
Cutter Wheels,	15	20	30
Cutter Blocks and Wheels,	50	75	1 25

BEMIS & CALL CO.'S COMBINATION WRENCH.

Fig. 378.

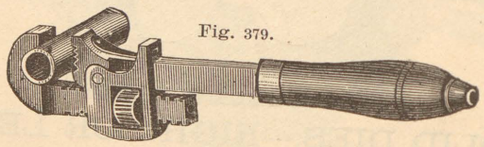


Bright. With Short Nut.

Length,	inch,	10	12	15
Size of Pipe,	"	½ to 1	½ to 1¾	½ to 2
Bright,	per dozen,	$23 00	$26 00	$37 00

STILLSON'S PATENT WRENCH.

Fig. 379.



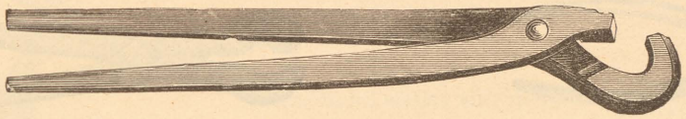
Made of Black Diamond Cast Steel. Pipe is not crushed by its use.

The Fine Tooth Wrench is especially adapted for connecting Steam and Gas Pipes. Ten inch and above have double spring. The Coarse Tooth Wrench is better adapted for Bolts, Nuts, Studs, etc.

Length open in Inches,	6	8	10	14	18	24	36	48
Takes from	⅛ in. Wire to ½ in. Pipe.	⅛ in. Wire to ¾ in. Pipe.	⅛ in. Wire to 1 in. Pipe.	¼ in. Wire to 1½ in. Pipe	¼ in. Wire to 2 in .Pipe.	¼ in. Wire to 2½ in. Pipe	½ in. Pipe to 3½ in. Pipe	1 in. Pipe to 5 in. Pipe.
Price, each,	$1.75	$2.00	$2.25	$3.00	$4.00	$6.00	$12.00	$18.00

PIPE TONGS—COMMON.

Fig. 380.

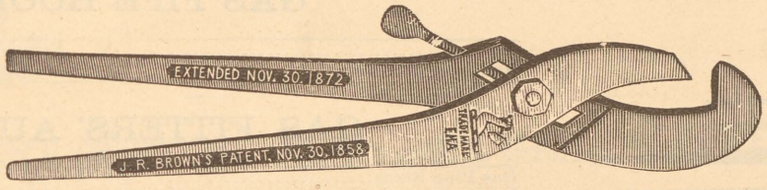


All sizes from $\frac{1}{8}$ t 4 inches.

Size,	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price,	44c.	52c.	56c.	72c.	90c.	$1.08	$1.30	$1.50	$1.90	$2.50	$3.25	$5.00	$6.00

BROWN'S PATENT ADJUSTABLE TONGS.

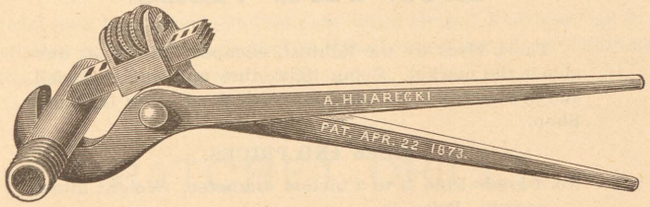
Fig. 381.



No. 1, taking from $\frac{1}{8}$ to $\frac{3}{4}$ Pipe..... $ 1 50
No. $1\frac{1}{2}$, " " $\frac{3}{8}$ to 1 " 1 75
No. 2 " " $\frac{1}{2}$ to $1\frac{1}{4}$ " 2 00
Na. 3, " " 1 to 2 " 2 75
No. 4, taking from $1\frac{1}{2}$ to 3 Pipe,..... $ 4 50
No. 5, " " $2\frac{1}{2}$ to 4 " 9 00
No. 6, " " 3 to 5 " 20 00
No. 7, " " 4 to 7 " 28 00

JARECKI'S ADJUSTABLE PIPE TONGS.

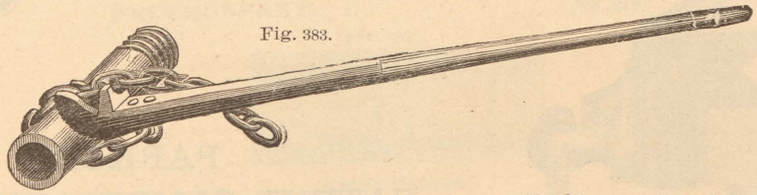
Fig. 382.



No. 0, Grips Gas Burner, to $\frac{3}{4}$, ... $ 3 00
No. 1, " " " $\frac{1}{4}$ to 1, ... 3 50
No. 2, " " " $\frac{1}{4}$ to $1\frac{1}{2}$, ... 4 00
No. 3, Grips, $\frac{1}{2}$ to $2\frac{1}{2}$, ... $ 5 00
No. 4, " $\frac{3}{4}$ to $3\frac{1}{2}$, ... 9 00
No. 5, " $2\frac{1}{2}$ to 6 , ... 16 00

ROBBINS' PATENT PIPE WRENCH.

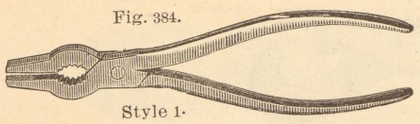
Fig. 383.



	Length of Lever.	*Size of Lever near Claw.*	*Size of Chain.*	*Weight.*	*Size of Pipe adapted to.*	*Price.*
No. 2,	$2\frac{1}{4}$ feet	$1\frac{1}{8}$ inches	$\frac{5}{16}$ inch	7 lbs.,	1 to 2 inches	$ 5 50
No. 3,	3 "	$1\frac{1}{4}$ "	$\frac{5}{16}$ "	12 "	$1\frac{1}{4}$ to 4 "	6 25
No. 4,	4 "	$1\frac{1}{2}$ "	$\frac{3}{8}$ "	24 "	2 to 6 "	9 00
No. 5,	5 "	$1\frac{3}{4}$ "	$\frac{1}{2}$ "	33 "	$2\frac{1}{2}$ to 8 "	12 50
No. 6,	6 "	2 "	$\frac{5}{8}$ "	50 "	4 to 10 "	16 00
No. 7,	7 "	$2\frac{1}{2}$ "	$\frac{3}{4}$ "	100 "	4 to 16 "	26 00

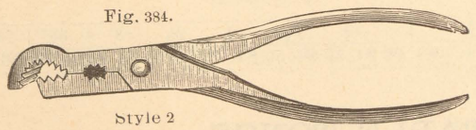
GAS PLYERS.

Fig. 384.



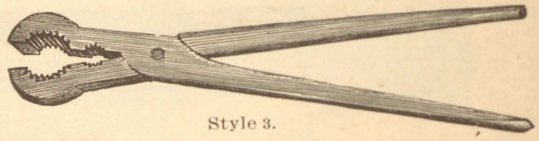
Style 1.

Fig. 384.



Style 2

Fig. 384.

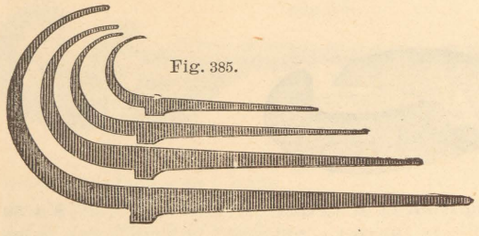


Style 3.

Number	0	1	Burner	2	3	4	5	6	7	8
Length	6	7	7½	8	9	10	11	12	13	14
Per dozen, Black	6 00	7 50	11 00	9 00	11 00	13 00	15 00	17 00	19 00	21 00
" " Polished	7 00	8 50	12 00	10 00	12 00	14 50	17 50	19 00	21 00	23 00

GAS PIPE HOOKS.

Fig. 385.

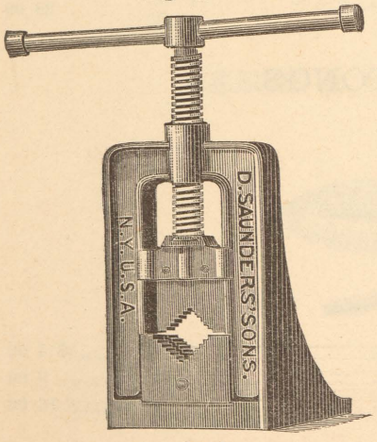


Size	¼	⅜	½	¾	1	1¼	1½	2
Price per thousand	$4 00	$5 50	$5 75	$7 00	$9 25	$12 00	$13 00	$16 00

GAS FITTERS' AUGERS.

Gas Pipe Sizes	¼	⅜	½	¾	1	1¼	1½	2	2½
Price	.80	$1 00	$1 12	$1 60	$1 92	$2 25	$2 50	$3 25	$4 00

Fig. 386.



No. 1.

MALLEABLE IRON PIPE VISES.

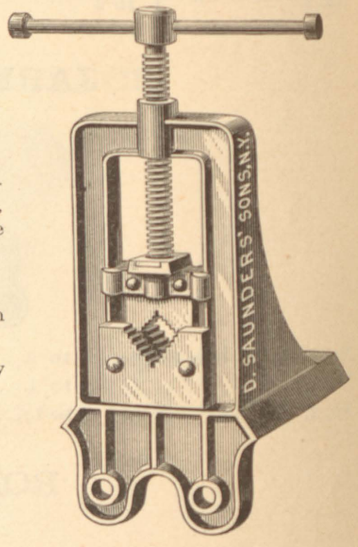
These Vises are the lightest, cheapest and most durable in the market. Being light, they are easily carried, and therefore well adapted for work done away from the Shop.

SIZES AND PRICES.

No. 1 holds Pipe ⅛ to 2 inches diameter. Weight fifteen pounds. Price, $8.

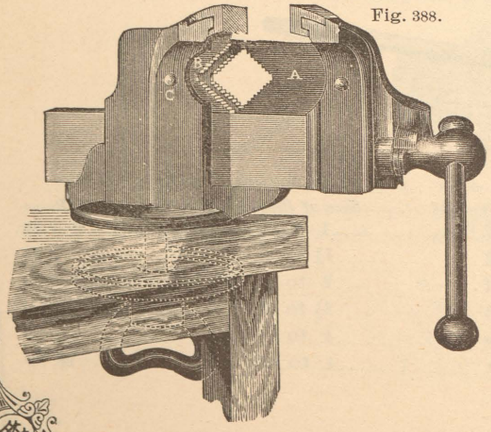
No. 2 holds Pipe ¼ to 2 inches diameter. Weight thirty pounds. Price, $12.

Fig. 387.



No. 2.

Fig. 388.



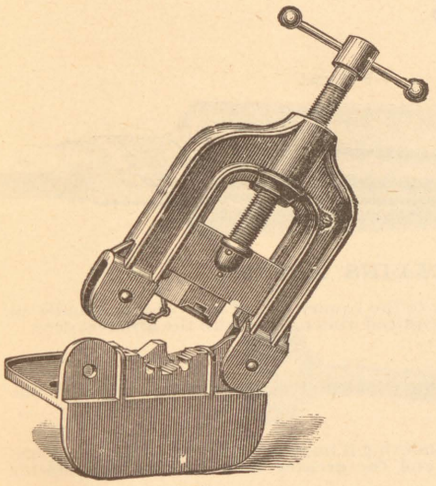
PARKER'S PATENT COMBINATION VISE.

No. 1 holds ⅛ to 2 inch Pipe ..... Price, $16.

No. 2 holds ⅛ to 3 inch Pipe ..... " $20.

MALLEABLE IRON PIPE VISE.

Fig. 389.



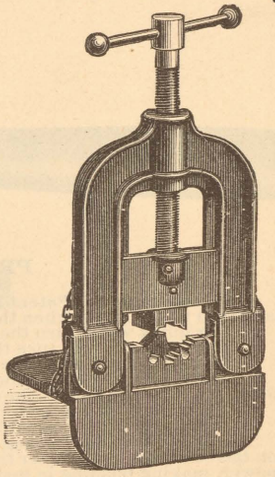
OPEN.

A very light, strong and cheap Vise.

No. 1 takes ⅛ to 2 inclusive, ...$10.00

No. 2 takes ⅛ to 3 inclusive, ... 13.00

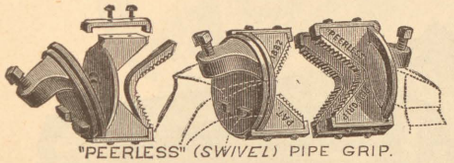
Fig. 390.



CLOSED.

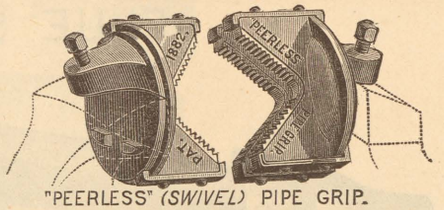
PATENT (SWIVEL JAW) PIPE GRIP, "PEERLESS."

Fig. 391.



"PEERLESS" (SWIVEL) PIPE GRIP.

Fig. 391.



"PEERLESS" (SWIVEL) PIPE GRIP.

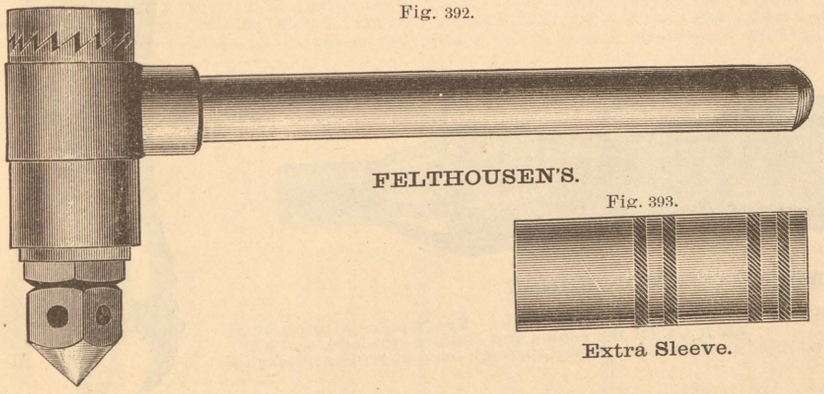
The above cut represents the new improved (Swivel Jaw) Pipe Grip, "Peerless," as it appears when attached to the Jaws of a Vise ready for use, and also illustrates each part in detail, showing the mechanism of its construction.

No. 1, For 3 to 4¾ inch Vise, holds ¼ to 2 inch Pipe (fit any Vise),.....$4 50

No. 2. For 5 to 7 inch Vise, holds ½ to 5 inch Pipe (fit any Vise),..... 6 00

RATCHET DRILLS.

Fig. 392.

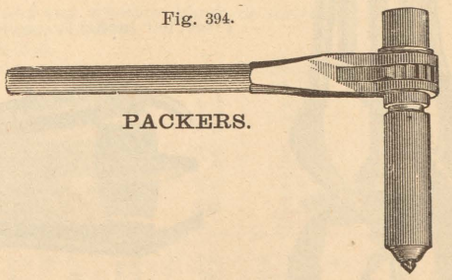


FELTHOUSEN'S.

Fig. 393.

Extra Sleeve.

Fig. 394.



PACKERS.

FELTHOUSEN'S.

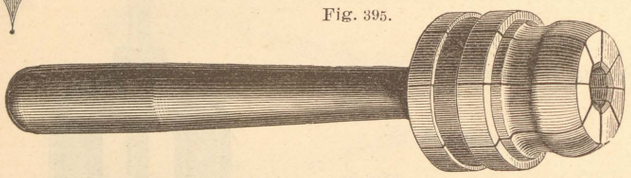
Numbers,	1	2	3
Length of Handle,	10	12	16
Length of Extra Sleeve,	3	3½	4½
Erice of Drill,	$7 00	$10 00	$12 00
Price of Sleeve,	2 00	2 50	3 00

PACKER'S.

Number,	1	2	3	4	5
Length of Handle,	10	12	16	18	24
Sleeve Pattern,	$10 50	$13 50	$16 00	$19 00	$23 00
Boiler Pattern,	9 00	10 50	.....	.....	.....

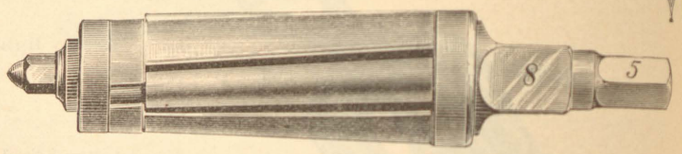
FLUE EXPANDERS.

Fig. 395.



PROSSER'S PATENT.

Fig. 396.



COLLINS' PATENT.

In using Collin's Patent Expander apply the power to the square end of the frame (8), or to the square end of the central spindle (5), and turn to the right, when the tool will feed itself, and enter the tube, expanding it to the required dimensions with the greatest ease.

For quick work, turn the large square, or end of frame (8).

For greater power turn the small square, or end of the central spindle (5).

To withdraw, turn to the left. All hammering or driving positively forbidden.

For repairing, or for tubes that have been used or weakened, it cannot be equalled, as the expansion is so smooth, even and uniform, that it never breaks the fibre of the iron.

Leaking tubes can be tightened when steam is on with ease and perfect safety.

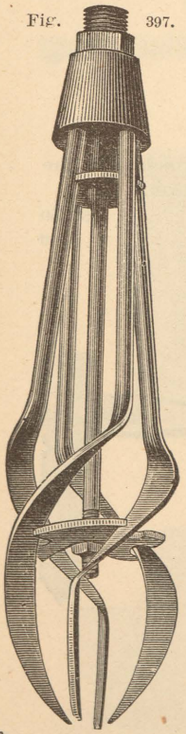
It will answer for any thickness of tube sheet.

It gives a slight swelling or expansion to the tube ends outside the boiler head, thus rendering it impossible for the tubes to yield; on the contrary, the greater the steam pressure in the boiler, the tighter the tubes become, and the greater their holding and bracing power, making beading in many cases unnecessary.

Outside diameter of Tubes, in inches	1	1¼	1½	1¾	1⅞	2	2¼	2½	2¾	3	3¼	3½	4	4½	5
Prosser's Patent, each	8 00	8 00	9 00	11 00	.....	12 00	13 00	15 00	18 00	22 00	26 00	30 00	33 00	37 00	42 00
Collins' Patent, each	.....	.....	15 00	16 00	16 00	18 00	22 50	25 00	27 00	30 00	35 00	40 00	45 00	.....	.....

FLUE SCRAPERS.

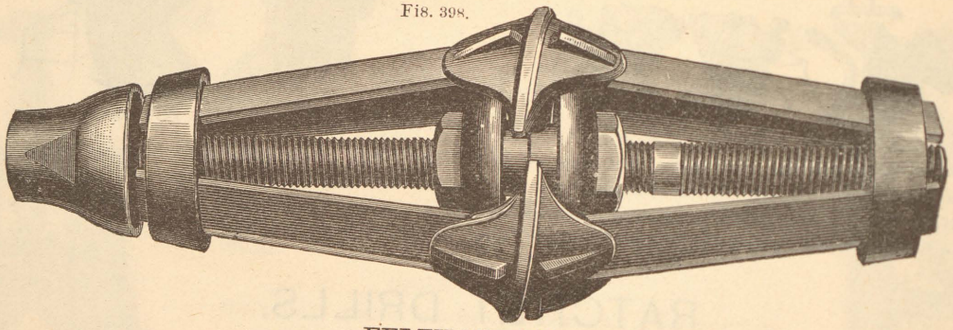
Fig. 397.



JACKSON'S.

Per inch.....$1 00.

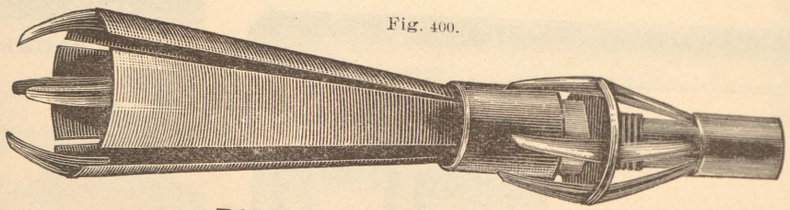
Fig. 398.



FELTHOUSEN'S.

Price, per inch.....$1 00

Fig. 400.

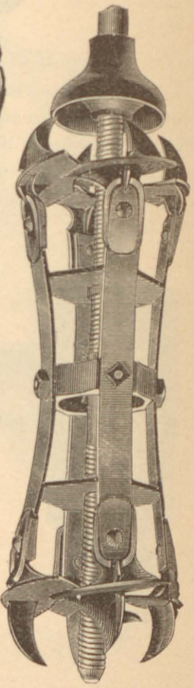


PATENT COMMON SENSE.

Made of best Cast Steel, wrought and malleable iron and brass. Every piece is duplicated and can be replaced at any time. ☞ It CUTS the scales and cinders off clean, and after tubes are once thoroughly cleaned it only needs to be passed through once at proper intervals to insure perfectly clean tubes.

Price, per inch.....$1 50

Fig. 399.



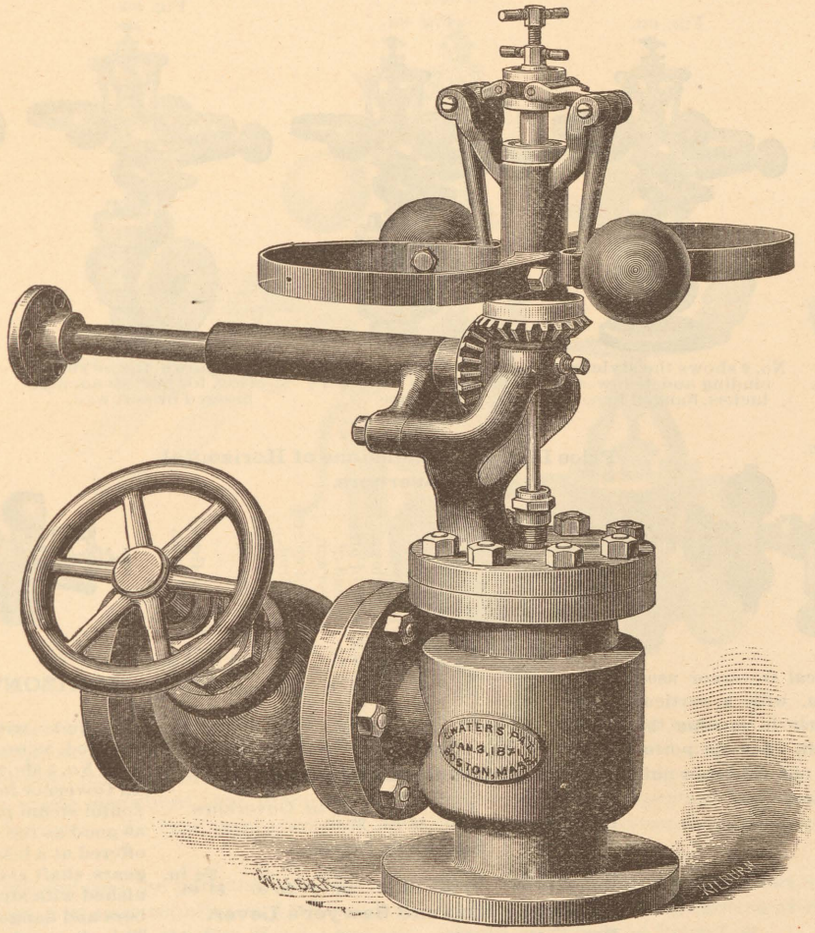
ENGINEER'S FAVORITE.

Per inch.....$1 00

State Inside measurement of Flue when ordering Boiler Flue Expanders, Scrapers and Brushes.

WATERS' ENGINE GOVERNOR.

Fig. 401.



The only Governor perfectly suited to every variety of Stationary and Portable Steam Engines. Having adjustable speed, automatic Safety Stop, Sawyer's Lever, and solid composition valves and seats.

In ordering Governors, be particular to specify style wanted, as shown on Page 120, and say whether black or finished. Pulley flanges are furnished gratis. Always specify size of Pulley if one is required. (See last column of table).

If no special dimensions are given, Governors will be sent in accordance with table below.

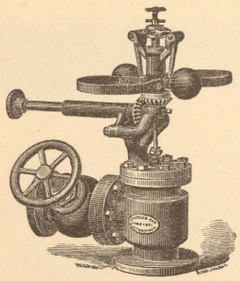
Size of Valve or Diam. of Steam Pipe.	Black finish with Speeder.	Bright finish with Speeder.	Extra for Automatic Safety Stop wth Sp'dr.	Diameter of Cylinder suitable for.	Extreme height.	Diamet'r of sp'ce required.	Distance from Base Flange to cent. of st. pipe.	Distance from cent. of Gov. to Stop Valve.	Distance from c. of Gov. to end of Pul. Shaft.	Diameter of base Flange.	Diameter of stop Valve Flange.	Speed of Gov. Rev. per min.	Diameter and face of Pulley preferred,	Net price of Pulleys.
½ in.	$ 17	$ 20		2 to 3 in.	10¼ in.	5¼ in.	2 in.	1½ in.	6 in.	3½ in.	Screw or Flge.	340	2 x ¾ in.	$ 0 50
¾ "	19	22		3 to 4 "	13½ "	9 "	2¾ "	1⅞ "	8½ "	4 "		260	2½x1 "	50
1 "	21	24		4 to 5 "	14 "	9 "	3 "	2⅛ "	8½ "	4½ "		260	2½x1 "	50
1¼ "	24	28	$ 3 50	5 to 6 "	16 "	13 "	3¼ "	2½ "	9½ "	5 "		240	3 x1¼ "	55
1½ "	27	32	4 00	6 to 7 "	19 "	14 "	3¾ "	2⅝ "	10½ "	6 "		210	3½x1¼ "	55
2 "	32	38	6 00	7 to 8 "	21 "	18 "	4⅛ "	3⅛ "	13½ "	7 "		200	4 x1½ "	65
2½ "	42	48	7 00	8 to 10 "	24 "	18 "	5 "	4⅜ "	14 "	8 "	6½ in.	200	4 x1½ "	65
3 "	54	63	8 00	10 to 12 "	28 "	22 "	5¾ "	5½ "	16 "	9 "	7 "	150	5 x2 "	80
3½ "	65	75	9 00	12 to 14 "	30 "	22 "	6¼ "	6 "	17 "	10 "	8 "	150	5 x2 "	80
4 "	76	86	11 00	14 to 16 "	34 "	25 "	6½ "	6¼ "	20 "	11 "	8½ "	150	6 x2 "	90
4½ "	88	100	12 00	16 to 18 "	36 "	25 "	7⅛ "	7 "	21 "	12 "	9½ "	150	6 x2 "	90
5 "	100	115	14 00	18 to 20 "	38 "	25 "	8¼ "	8⅜ "	22 "	13 "	11 "	150	6 x2 "	90
6 "	133	150	16 00	24 to 28 "	42 "	34 "	10 "	8½ "	23 "	14 "	12 "	125	8 x2½ "	1 35
7 "	158	180	18 00	28 to 32 "	44 "	34 "	10½ "	10 "	24 "	15 "	13 "	125	8 x2½ "	1 35
8 "	192	220	20 00	33 to 36 "	58 "	40 "	12 "	11 "	26 "	16 "	14 "	100	10 x2½ "	1 90
9 "	215	245	25 00	36 to 40 "	62 "	42 "	13 "	12 "	28 "	18 "	16 "	100	10 x2½ "	1 90
10 "	240	275	25 00	40 to 44 "	66 "	48 "	14 "	13¼ "	30 "	20 "		100	12 x3 "	3 00

Sawed for Steam Pipe.

The speed noted in table is only *average;* the *correct speed* is plainly stamped on the top brass collar of each Governor. Arrange the pulley diameters to give this speed at the desired speed of engine. Then by the screw at top of Governor the speed may be correctly adjusted or changed in either direction.

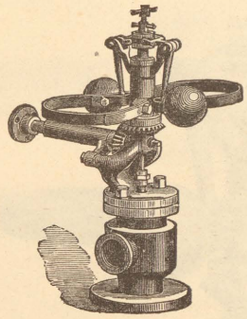
WATERS' ENGINE GOVERNORS.

Fig. 402



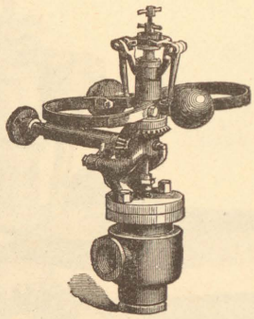
No. 1 shows the style including and above 1½ in.

Fig. 403.



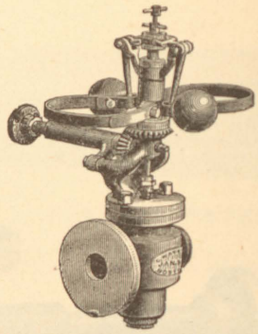
No. 2 shows the style including and below 3½ inches, flanged base.

Fig. 404.



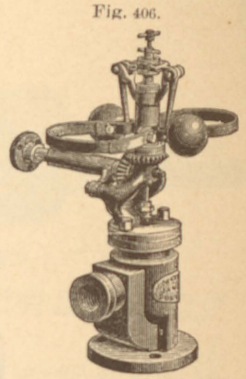
No. 3 shows the style including and below 3½ in , screw base.

Fig. 405.



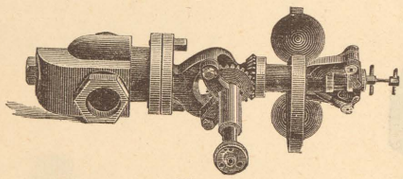
No. 6 shows the style of Gov. for hor. steam pipe flanged or screwed.

Fig. 406.



No. 13 shows the style of Gov. when bolted to the st. dome with side outlet flanged or screwed.

Fig. 407.



No. 10.

No. 10 shows our Vertical Governor used in a horizontal position, with a vertical steam pipe, for convenience in running the belt *direct* to engine shaft. Several portable engine builders use our Governor this way with *entire satisfaction.*

Price List and Dimensions of Horizontal Governors.

Size of Valve diam. of pipe.	Price Black.	Size of Flnge screwed for Pipe unless otherwise ord	From Cent. of Pipe to Cent. of Pulley.	Centre of pipe to end of Governor.	Diam. of sp'ee required.	Rev. per min.	Size of Gov. Pulley in in.
½ in.	$ 16	3½ in	3¾ in	9½ in	8in	340	2 x¾
¾ "	17	4 "	4¾ "	11½ "	9in	260	2½x¾
1 "	19	4½ "	5 "	12 "	9in	260	2½x¾
1¼ "	22	5 "	6 "	13½ "	10in	240	3 x1
1½ "	25	6 "	7 "	15½ "	14in	210	3½x1
2 "	29	7 "	8½ "	18½ "	18in	200	4 x1½

Automatic Safety Stop.

For	1¼,	1½,	2,	2½ in. Governors.	
Extra	$3 50	$4 00	$6 00	$7 00	

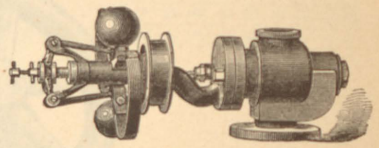
Sawyer's Lever.

For	1¼,	1½,	2,	2½,	3,	3½ in.
Extra	$3 00	$3 25	$4 00	$5 00	$6 00	$7 00

Safety Stop and Sawyer's Lever.

For	1¼.	1½,	2,	2½,	3,	3½ in.
Extra	$6 00	$7 00	$9 00	$11 00	$13 00	$15 00

Fig. 408.



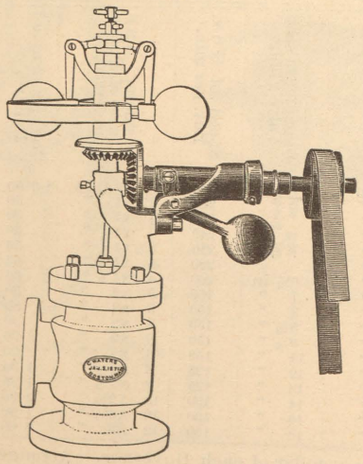
No. 5.

HORIZONTAL GOVERNORS.

Made with flanges, or both ends screwed, as ordered.

No. 5 shows our improved horizontal Governor for either vertical or horizontal steam pipe. It is in every respect as good as the vertical Governors, but is offered at a less price, doing away with gears. shaft and brackets; these are furnished with straight or angle valve chambers and flanged or screwed openings.—The size and position of the pulley is fixed.

Fig. 409.



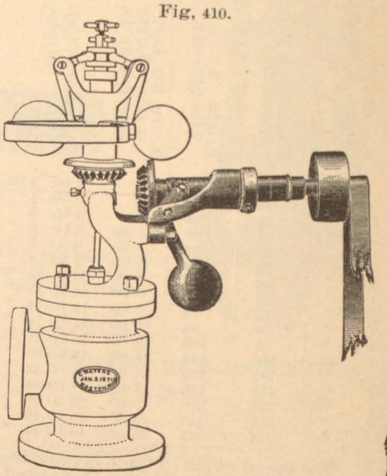
AUTOMATIC SAFETY STOP.

Figs. 409 and 410 show our improved Automatic Safety Stop, which is rapidly gaining the favor and confidence of the trade, having proved unfailing in action in the six years past, and being entirely free from the usual objections of sticking or gumming, so common and fatal to other styles. Fig. 409 shows the revolving head resting on a disk fastened to the back of the gear, and the strain of the belt, while on the pulley, holds it in this position; but when the belt runs off or breaks, the weighted lever drops, throwing the shaft back out of gear, allowing the top to drop and close the valve as shown in Fig. 410. To start again, simply raise the top part and lift the weighted lever into position and hold it while putting on the belt. It works equally well with either horizontal, vertical or angular belt, and only when the belt breaks or runs off; consequently, *never use flanged pulleys*, which would prevent the belt going off.

The above styles are made in all sizes above 1½ inch, and are made with Sawyer's Lever, in sizes from 2 to 3½ inch inclusive, if ordered.

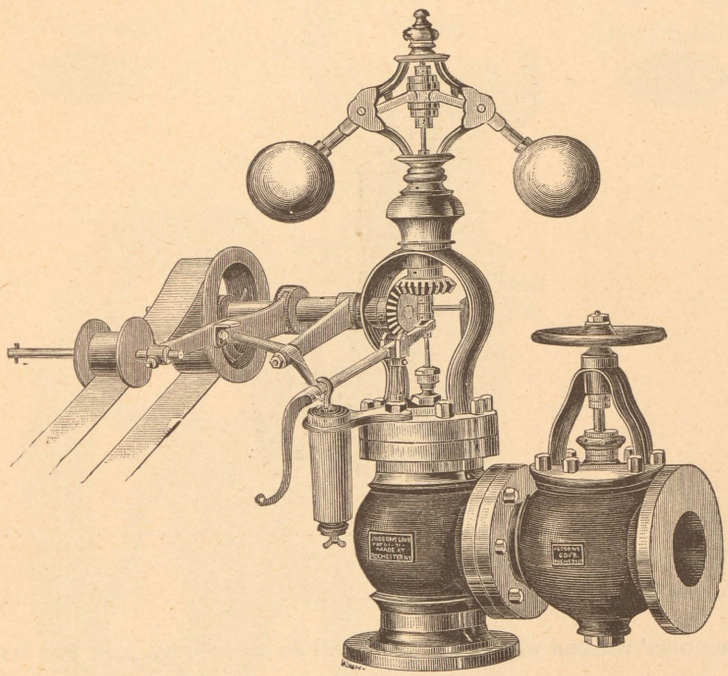
Plain Black Flanged Base Governors will be sent in all cases, unless otherwise ordered.

Fig. 410.



JUDSON'S PATENT IMPROVED GOVERNORS.

Fig. 411.



The superiority which has made the Judson Governor the standard for thirty years, is derived from excellence of material and workmanship, skill in construction, the use of patented novelties, and improved process of manufacture. The liberal policy pursued by this firm in experiments for improvement, and securing at whatever cost the ownership of every real improvement made elsewhere, has given them control of the most important improvements made in Steam Governors the past thirty years. No real improvements have been made in Governors anywhere not contained in the Governor shown above.

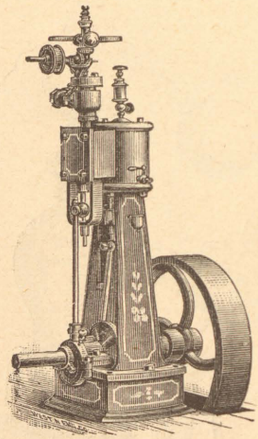
When Governors are ordered, be particular and say, Governor with Stop Valve, or without Stop Valve; and either Plain or Bright Finish, as you may require, and with or without Speed Changer, Stop Motion or Sawyer's Lever. Exact speed of each Governor is marked on the Top Head. See also Column of Speeds in Price List.

Capacity of Governor or Diam'r of Steam Pipe, in inches.	PRICE.					Size of Governor to Diameter of Engine Cylinder at ordinary speed of Piston (300 feet per minute) For greater speed use larger Governors.	Diam. of Base Flange, in inches.	Diam. of Side Flange, in inches.	Distance from Base Flange to Center of Steam Pipe, inches.	Distance from Center of Governor to end of Pulley Shaft, inches	Ext'me Height, inches.	Distance from Base Flange to Center of Pulley Shaft, inches.	Distance from Center of Governor Valve to Stop Valve, in inches	Speed of Governor. Number of Revolutions per minute.	Greatest Expansion of Balls, in inches.	Diameter and Face of Pulley that should be put on each Govern'r to drive it properly, in inches.
	Plain.	Bright Finish.	Spring Speeder for altering Speed.	Stop Motion and Spr'g Speeder.	Improved Stop Valve.											
½	$ 15 00	$ 17 00	$ 1 60	.....	.....	2 to 3	Screwed.		2	7	11½	5⅜	1⅝	320	8¾	3 x 1
¾	16 00	18 00	1 70	.....	.....	2 " 3	3¾		3	7	12¾	6⅝	2	320	8¾	3 x 1¼
1	18 00	20 00	1 80	.....	.....	4 " 5	4½	Screwed for Steam Pipe.	2⅜	7½	13⅜	7⅝	2⅛	160	9¾	3½ x 1¼
1¼	20 00	23 00	1 90	.....	$ 6 00	5 " 6	5		3	10¼	18¼	8¾	2½	140	12	4 x 1¼
1½	23 00	27 00	2 00	$ 5 00	7 50	6 " 7	5¾		3⅜	11¾	20½	10¼	3	135	12¾	4 x 1½
2	27 00	31 00	2 20	6 00	9 00	7 " 8	6½		4	12½	23	12⅞	3	135	13½	4½ x 1½
2¼	32 00	37 00	2 40	7 00	11 00	8 " 9	7½	6	4¾	13¾	26¾	14	4¾	110	17¼	5 x 2
2½	36 00	41 00	2 60	7 00	12 00	9 " 10	7½	Screwed.	4¾	14¼	28	14¼	4	105	18	5½ x 2
2¾	40 00	46 00	2 80	8 00	14 00	10 " 11	8½	7	5⅛	14¼	28¾	15¼	5⅝	105	18	6 x 2
3	45 00	52 00	3 00	8 00	17 00	11 " 12	9	8	5¾	15½	32¾	17½	6	98	19¾	7 x 2
3½	54 00	62 00	3 25	9 00	21 00	12 " 14	10	9	6½	17	35½	19¾	6½	98	21¾	8 x 2
4	64 00	73 00	3 50	10 00	25 00	14 " 16	11	10	7¼	18½	38	20½	7	95	25¼	9 x 2½
4½	74 00	84 00	3 75	11 00	31 00	16 " 18	11½	10½	7½	21	42	22¼	7	92	28	10 x 2½
5	84 00	95 00	4 00	12 00	37 00	18 " 20	12	11	7¾	21	42½	22¾	7¼	92	28	11 x 3
5½	97 00	109 00	4 25	14 00	42 00	20 " 23	13	12	8½	22	48	24½	8	85	32	12 x 3
6	110 00	123 00	4 50	15 00	50 00	23 " 26	14	13	9¼	23	50	26⅜	8¼	77	35	14 x 3½
7	130 00	144 00	5 00	17 00	60 00	26 " 28	15½	14½	9½	23	51	27⅜	9	77	35½	14 x 3½
8	160 00	175 00	6 00	19 00	75 00	28 " 30	17	16	10⅜	24	55½	30	10	70	37½	16 x 4
9	180 00	196 00	7 00	21 00	.....	30 " 33	18	17	11¾	26	59	33⅝	11	70	40	18 x 4½
10	200 00	218 00	8 00	23 00	.....	33 " 37	20	19	13¼	26	63	37	12⅝	70	40	18 x 4½

THE OLDS' VERTICAL STEAM ENGINE.

3, 5 AND 10 HORSE POWER.

Fig. 412.



Three-Horse Power Engine,	$125 00
Five-Horse Power Engine,	150 00
Ten-Horse Power Engine,	225 00

Some of the Manufacturers' reasons why this Engine will do more work and last longer than other styles of manufacture:

First. It is vertical, which is the most durable plan on which an engine can be built, no wear coming on the Cylinder and Piston, and much less on the Cross-head and Slides, than in horizontal engines.

Second. It is balanced, enabling it to be run at a high speed, making what little wear there is come equal on the different parts, consequently giving more power.

Third. It has less friction than any other engine built. It requires no more expense of power to run our Piston in its Cylinder, than it would to run it in open air, and we guarantee every one tight and to stay so.

Fourth. It is built so that all its parts can be easily got at to oil and keep clean, and being upright, it takes only one-quarter the room of a horizontal engine. Its Connection Rod is of strong Brass, and the Bearings are all of the best anti-friction metal known.

Fifth. The design suits everybody, all of our Engines being made alike, the Cylinder and Steam Chest being covered with Brass, the Balance Wheels turned and finely painted, and furnished with the celebrated Waters' Governor, which (with our arrangement of Valve) equals any automatic cut-off in use.

Sixth. Our prices are lower, comparing the finish, power and durability, than any other Engine built, and we fully guarantee every part. Every Engine is tested at our works before sending out.

We manufacture these Engines in three sizes—3, 5 and 10 Horse Power—and they are especially adapted to the following business:

The 3-Horse Engine for Printing Offices, Cheese Factories and all light powers; the 5-Horse is remarkably adapted for Farm Use, Sawing Wood, Threshing, Cutting Feed and Grinding, also for Cider Mills, Small Shops and Elevators; while our 10-Horse is especially adapted for small Grist Mills, larger Elevators, Wood and Iron Shops, etc., the prices making them eligible to all.

SCHULTZ'S VERTICAL ECLIPSE STEAM PUMP.

PATENTED JUNE 4, 1878 ECLIPSE

REISSUED JULY 8, 1879 ECLIPSE

Fig. 413.

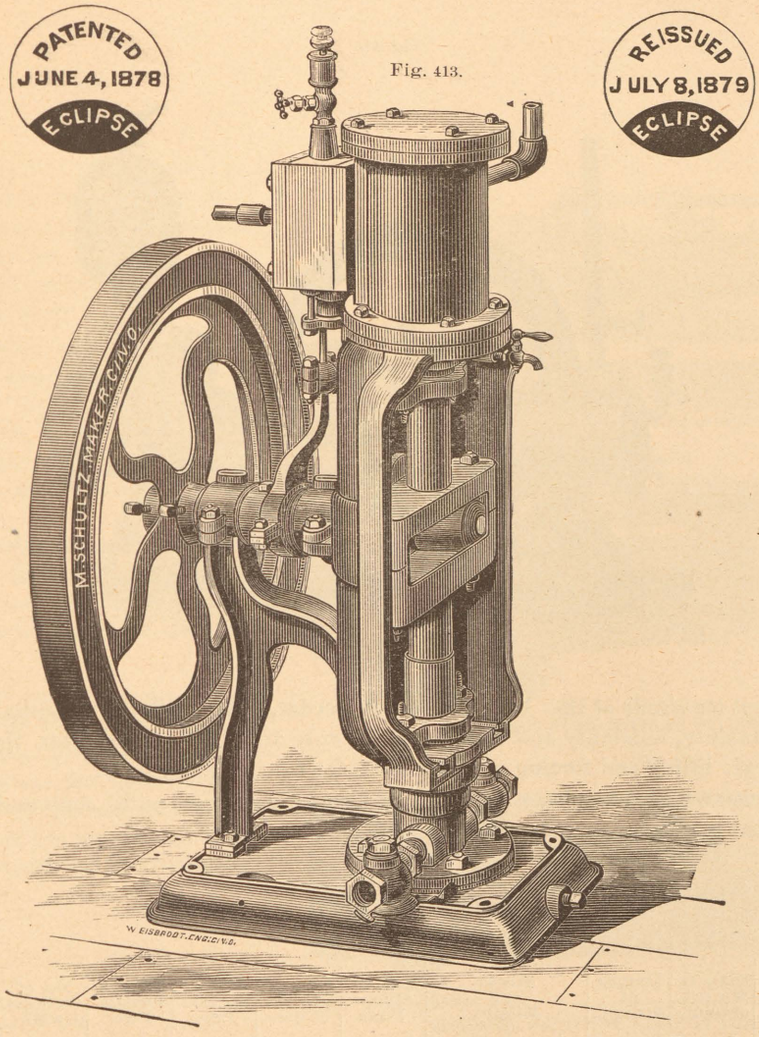


TABLE OF SIZES, CAPACITIES AND PRICES OF VERTICAL BOILER FEEDERS.

Number.	Diameter Steam Cylinder, inches	Diameter of Water Plunger.	Stroke in inches.	Size of Steam Pipe.	Size of Escape Pipe.	Size of Supply Pipe.	Revolutions per minute.	No. of Gallons per minute.	Horse-Power it will Feed.	Price of Pump.
1.	3	$1\frac{3}{8}$	$2\frac{1}{2}$	$\frac{1}{2}$	1	1	10 to 100	2	16	$ 44 00
2	$3\frac{1}{2}$	$1\frac{5}{8}$	3	$\frac{1}{2}$	1	1	10 to 100	3	27	55 00
3	4	$2\frac{3}{8}$	4	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	10 to 80	4	45	66 00
4	$4\frac{1}{2}$	$2\frac{3}{4}$	4	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	10 to 70	8	60	82 50
5	$4\frac{3}{4}$	3	$4\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	10 to 100	12	80	110 00
6	5	$3\frac{1}{4}$	5	1	$1\frac{1}{2}$	$1\frac{1}{2}$	10 to 60	14	100	150 00
7	6	4	5	1	$1\frac{1}{2}$	2	10 to 60	20	150	175 00

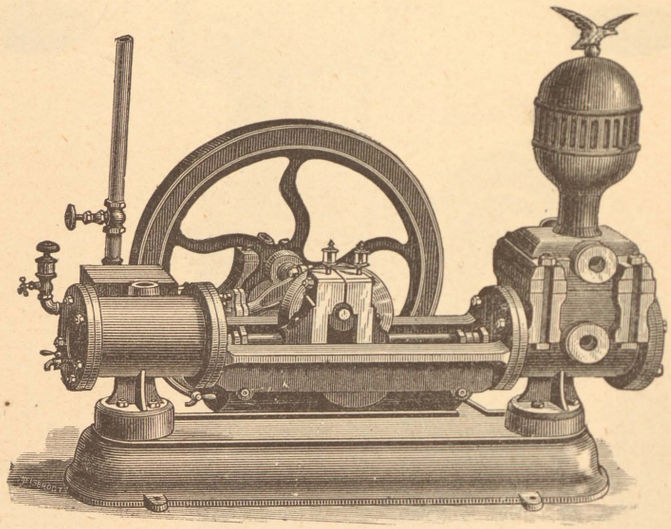
No. 1 will supply a boiler 8 feet high, 36 inches in diameter.
No. 2 will supply a boiler 10 feet high, 42 inches in diameter.
No. 3 will supply a boiler 20 feet long, 40 inches in diameter.
No. 4 will supply two boilers 20 feet long, 40 inches in diameter.
No. 5 will supply two boilers 20 feet long, 40 inches in diameter.
No. 6 will supply three boilers 20 feet long, 44 inches in diameter.
No. 7 will supply three boilers 20 feet long, 44 inches in diameter.

NOTE.—The cheapest Pump for practical use is a larger size than actually required. The slower you can run a Pump, and get the water needed, the longer it will last. The first cost is a slight item compared with the service obtained.

These Pumps will work up to 100 pounds steam pressure. For a higher pressure than 100 pounds a Double-Acting Feeder is recommended.

DOUBLE ACTING ECLIPSE FLY WHEEL PUMP.

Fig. 414.



This pump is a perfect fac-simile of the Eclipse Boiler Feeder, having all the essential features of the Feeder in point of simplicity, durability, reliability and cheapness, the only difference being that this Pump is horizontal, while the Feeder is vertical; lifting and forcing water, the Feeder forcing water only.

It is especially designed for use at railway stations, distilleries, breweries, mills, soap and oil works, and factories generally, and can also be used as a Boiler Feeder.

PRICE LIST.

No.	Diam'tr Stm.cyl. Inches.	Diam'tr W'r.cyl. or pump	Length of Stroke.	Stroke per Minute.	Size of Steam Pipe.	Size of Exha'st Pipe.	Size of Suction Pipe.	Size of Discharge Pipe.	No. of Gallons per Min.	W'ght com. ready to Pipe.	Price.
1	5	2	4	15 to 100	1	$1\frac{1}{4}$	$1\frac{1}{4}$	1	12	425	$ 125
2	4	3	4	15 to 100	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	15	475	150
3	6	3	6	15 to 80	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$1\frac{1}{2}$	20	900	225
4	7	4	7	15 to 80	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	2	35	1200	275
5	8	5	7	15 to 60	$1\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$	70	1300	350
6	8	6	7	15 to 60	$1\frac{1}{2}$	2	$3\frac{1}{2}$	3	100	1500	400
7	9	6	7	10 to 50	$1\frac{1}{2}$	2	4	4	150	1600	450

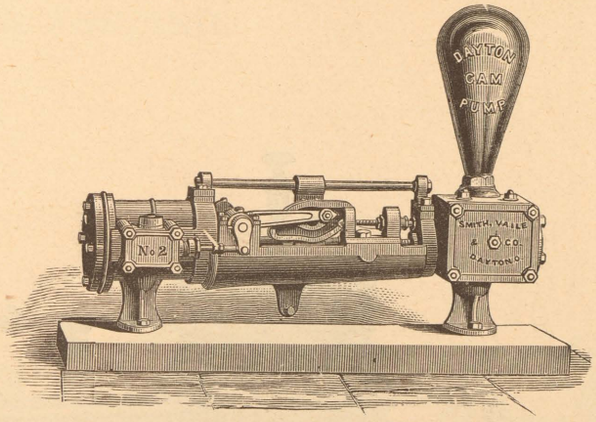
NOTE.—Prices subject to change without notice.

The above prices are without Boilers.
Nos. 1, 3, and 5 are intended for feeding boilers and tanks.
Nos. 2, 4, and 6 are intended for railway stations or tank pumps specially.
When wanted for Station Pumps, will furnish boiler and trimmings at lowest market rates.
The Feeders can also be used on steamboats, as well as for large batteries of boilers in mills or factories.
Every Pump Warranted.

NOTE.—Water at boiling point can not be lifted.

THE DAYTON CAM PUMP.

Fig. 415.

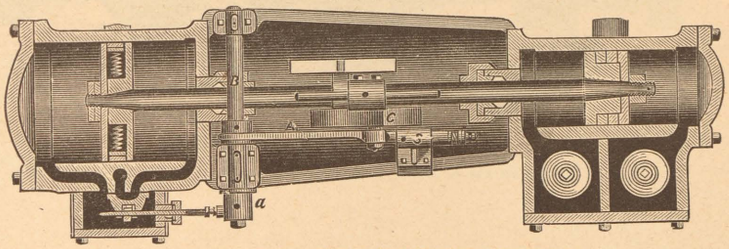


In offering to the public the above direct and Double-acting Steam Piston Pump, we have no hesitation in claiming for it a decided superiority over any other in use. It has been fully tested by the public under every variety of conditions, and its superior qualities freely admitted.

The Steam Valve is a plain slide valve, worked by means of a Cam bolted on the Piston Rod and moving with it, and by the shape of the Cam the stroke is slowed down at each end, giving ample time for the Water Cylinder to fill and Water Valves to close before return stroke, insuring a full stream every stroke, and preventing the Pump Piston from striking against the water when the Cylinder is but partially filled, and it is utterly impossible for the Steam Valve to be thrown in such a position as to shut off steam and stop the Pump.

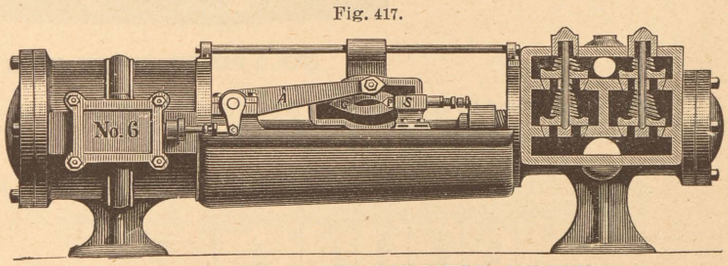
Any ordinary engineer can fully comprehend the mechanism of the Cam Pump, and any part of the Pump can be repaired without being taken to the workshop. To keep the Cam Pump in perfect running order requires less care than a plain slide valve engine of the same size. It can be run at a high rate of speed without thumping,

Fig. 416.



SECTIONAL PLAN, REGULAR PATTERN CAM PUMP.

Fig. 417.



SECTIONAL ELEVATION, REGULAR PATTERN CAM PUMP.

NEW AND REDUCED PRICE LIST OF BOILER FEEDERS.

Designed and built especially for pumping HOT WATER and feeding Steam Boilers, and also for forcing water under great pressure, or to a high elevation.

Number.	Diam. of Steam Cylinder.	Diam. of Water Cylinder.	Length of Stroke.	Gallons per Single Stroke.	Capacity at following Speed.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge	Length over all.	Width over all.	Height over all.	Weight boxed.	Price.	Number.
	Inches.	Inches.	Inches.			Inches.	Inches.	Inches.	Inches.	Ft. In.	Ft. In.	Ft. In.	Pounds.	Dolls.	
1	3⅝	2⅛	3	.046	150 Strokes, 7 galls.	½	¾	1	¾	2 4	8	1 10	160	80	1
2	4¾	3	4	.122	150 " 18.3 "	½	1	1¼	1	2 10	11	2	245	135	2
3	5	3⅛	6	.129	125 " 25 "	¾	1¼	1½	1¼	3 11	1 1	2 7	380	185	3
4	6⅜	4	7	.38	125 " 47.5 "	1	1¼	2	1½	3 11	1 1	2 7	420	220	4
5	7	4	10	.544	125 " 68 "	1	2	2½	2	5 6	1 3	3	680	300	5
6	9	5	10	.850	100 " 85 "	1¼	2½	3	2½	5 6	1 5	3 1	825	350	6
6½	11	7	10	1.66	100 " 166 "	1½	2½	4	3	5 6	1 5	3 1	1210	425	6½
7	11	6½	14	2.01	100 " 200 "	1½	2½	4	3	7 9	2	4 4	2150	500	7
8	13½	7½	14	2.68	100 " 268 "	2	3	5	4	7 9	2	4 4	2300	600	8
9	16½	10	18	6.12	75 " 460 "	2½	4	6	5	8 10	2 6	5 10	3200	800	9

In comparing our Price Lists with those of other Manufacturers, the actual size of Cylinders, length of stroke, and amount of water pumped at each stroke, should be consulted, and not the number indicating the size of Pump.

THE DEANE PATENT STEAM PUMP.

Fig. 418.

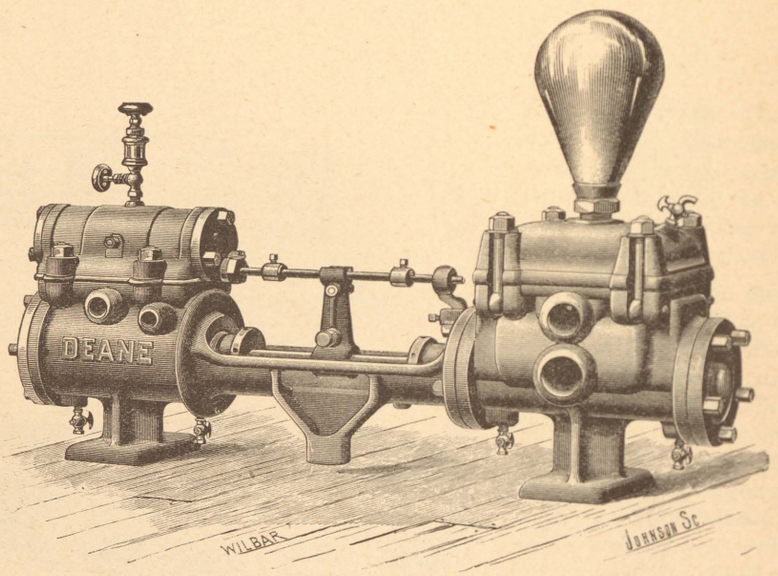


Fig. 419.

NO. 3 PUMP, WITH HAND LEVER.

Deane's Patent Hand Power Attachment is superior to all others. It is readily attached, easily operated, and most simple in construction. Invaluable for washing decks, for filling boilers after blowing off, and for instant use in case of fire. Every machine warranted. These Pumps are arranged for either hot or cold water.

REDUCED PRICE LIST OF REGULAR SIZES.

Number.	Diam. of Steam Cylinder.	Diam. of Water Cylinder.	Length of Stroke.	Gallons per Single Stroke.	Strokes per Min.	Capacity per Min. at Given Speed.	Extreme Length.	Extreme Width.	Size of Steam Supply Pipe.	Size of Steam Exhaust Pipe.	Size of Suction.	Size of Discharge	Price.
	Inches.	Inches.	Inches.				Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Dol
0	3	2	5	.06	1 to 300	150 Strokes, 9 galls.	29½	7	½	¾	1¼	1	85
1	3½	2¼	5	.08	1 to 300	150 " 12 "	30	7½	½	¾	1¼	1	125
2	4	2½	5	.11	1 to 300	150 " 16 "	30	7½	½	¾	1¼	1	150
3	5	3¼	7	.25	1 to 275	125 " 31 "	42	9	¾	1	2	1½	200
4	5½	3¾	7	.34	1 to 275	125 " 42 "	42	9	¾	1	2	1½	225
4½	7	4¼	8	.49	1 to 275	120 " 58 "	50	11½	1	1½	3	2	275
5	7	4½	10	.69	1 to 250	100 " 69 "	54	11½	1	1½	3	2	350
6	7½	5	10	.85	1 to 250	100 " 85 "	54	11½	1	1½	3	2	375
6½	8	5	12	1.02	1 to 250	100 " 102 "	63	12	1	1½	3	2½	400
7	10	6	12	1.47	1 to 200	100 " 147 "	64	14¼	1½	2	4	4	450
8	12	7	12	2.00	1 to 200	100 " 200 "	64	16¼	2	2½	5	4	525
9	14	8	12	2.61	1 to 200	100 " 261 "	64	18	2	2½	6	5	600
10	16	10	16	5.43	1 to 200	80 " 434 "	81	22	2	2½	8	6	
11	18	12	24	11.75	1 to 180	50 " 587 "	111	22	3	3½	10	8	
12	20	14	24	15.99	1 to 180	50 " 799 "	112	34	3	3½	12	10	
13	24	18	24	26.43	1 to 150	50 " 1321 "	112	40	4	4½	14	12	
14	30	22	24	39.49	1 to 150	50 " 1974 "	114	45	4½	6	18	14	

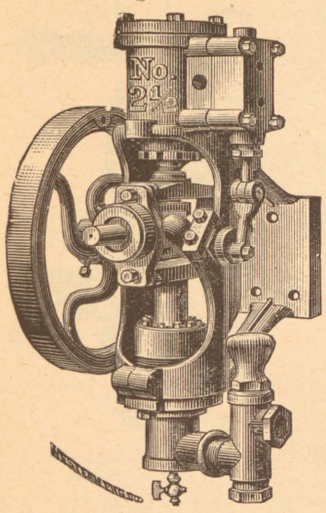
Prices dep'nd on duty Required.

Every Machine thoroughly tested and sold under a full Guarantee.

"TORRENT" AND "UNIQUE" STEAM PUMPS.

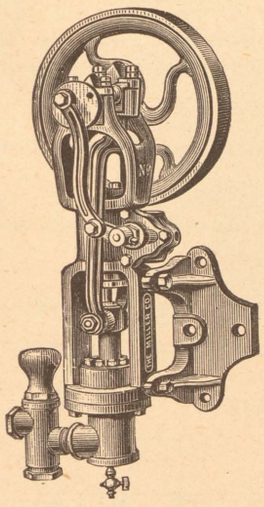
FOR BOILER FEEDING.

Fig. 419.



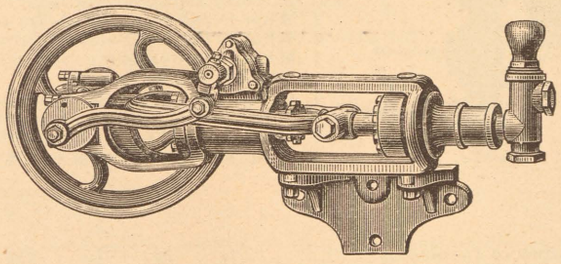
No. 2½.
Torrent Steam Pump used either horizontally or vertically.

Fig. 420.



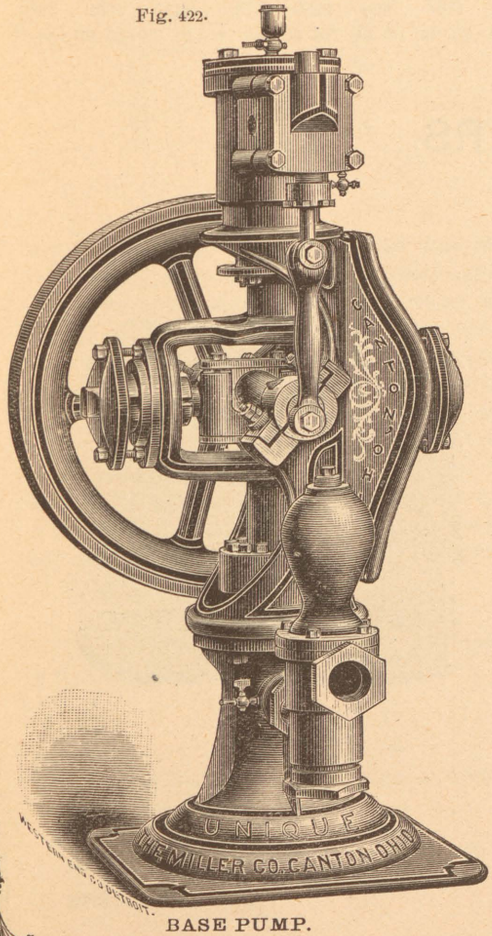
No. 2½.
Unique Steam Pump used either vertically or horizontally.

Fig. 421.



Price.....$28 50
Size, Capacity, and Dimensions same as 2½ Unique Pump.

Fig. 422.



BASE PUMP.

SIZES, DIMENSIONS AND PRICES.

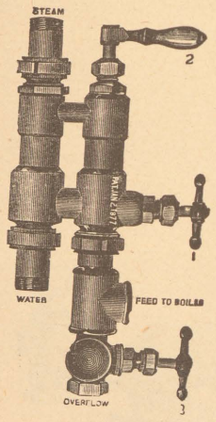
No.	Diam'tr Stm. cyl. Inches.	Diam'tr Water Plunger	Length of Stroke.	Size of Steam Pipe.	Size of Exha'st Pipe.	Size of Water Pipe.	Revolutions per Minute.	Gals. it will feed pr hour.	Horse Power av. will Feed.	Price of Bracket Pump.	Price of Base Pump.
1½	2⅝	1¼	1¾	¼	⅜	½	100	60	8	27 50	29 00
2½	2¾	1 5–16	2	¼	⅜	¾	90	75	12	28 50	30 00
3	3⅛	1¾	2½	⅜	½	1	80	125	20	44 00	45 00
4	4¼	2½	2¾	½	¾	1¼	70	200	35		63 00
5	4½	2¾	3	½	¾	1½	60	250	60		75 00
6	5¼	3¼	4	¾	1	2	50	500	100		93 00
8	6⅛	4¼	5	¾	1	2½	40	800	135		150 00

The revolutions and gallons are merely the average; can run much slower or faster. Can double the quantity on any of these, but in ordering better have enough capacity.

The Base Pumps for stationary use are the heaviest and strongest made.

THE HANCOCK INSPIRATOR.

Fig. 423.

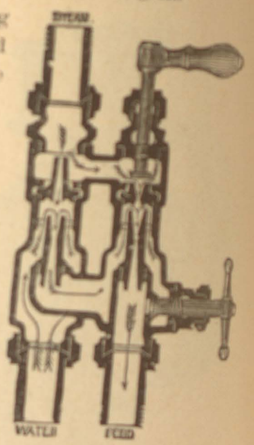


Is an apparatus for feeding water to steam boilers, for filling tanks, and for any and all purposes for which a pump may be used in handling water. It has no movable or working parts, is durable and will not get out of order.

When Ordering an Inspirator please Answer the following Questions:

1. What is the horse-power of boiler or boilers; what is the quantity of water required per hour?
2. What is the range of steam pressure?
3. What is the temperature of supply?
4. What is the extreme lift or head, vertically or horizontally, from supply to Inspirator?
5. Is water used for other purposes than feeding boiler?
6. What is the number of boilers?
7. What type of boiler is used?
8. What are the dimensions of boilers?

Fig. 424.



Number of Inspirator	7½	8¾	10	12½	15	17½	20	22½	25	30	35	40	45	50
Size of Suction and Feed Pipe	⅜	½	½	¾	¾	1	1	1¼	1¼	1½	1½	2	2	2½
" " Steam Pipe	⅜	⅜	⅜	½	½	¾	¾	1	1	1¼	1¼	1½	1½	2
Gals. per hour, 60 lbs. pressure	60	85	120	220	300	360	540	700	900	1260	1740	2230	2820	3480
Price, each	16 00	18 00	20 00	25 00	30 00	40 00	45 00	55 00	60 00	75 00	90 00	110 00	125 00	150 00

LAWN SPRINKLERS.

Fig. 425.

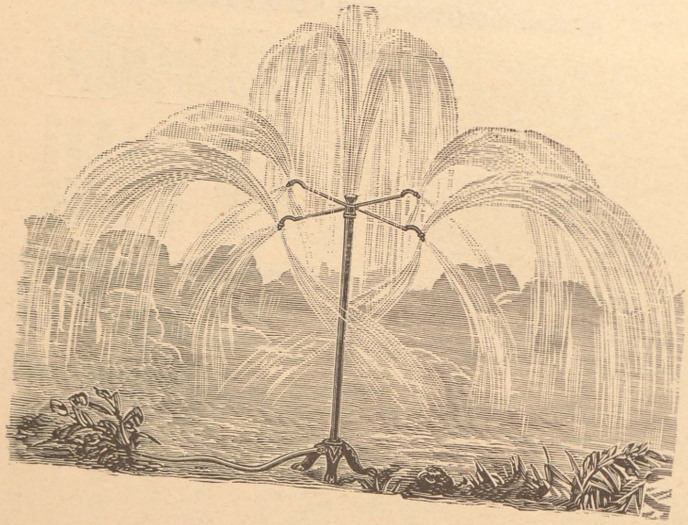


Fig. 426.

Lawn Sprinkler, four Arms, Each ..... $ 6 00
" " six " " 7 00
Globe Lawn Sprinkler, per doz 15 00

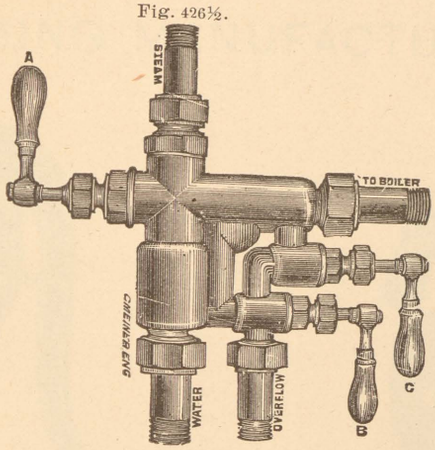
THE DUPLEX INJECTOR.

Is one of the best appliances known for feeding boilers, as it always delivers the water hot to the boiler, and all the steam used, in operating it, is returned to the boiler, there being no loss of pressure or heat except by radiation, and if pipes are covered, practically no loss whatever.

There are no movable parts for adjustment, no valves to wear, so as to impair the working of the Injector, and it can be safely said that no Injector made is so little liable to get out of order as the Duplex Injector.

Water can be drawn from it for any purpose without interrupting the feed.

Fig. 426½.



It requires no special adjustment for varying pressures, hot or cold water, water under pressure, or suction.

It is superior in design, material and workmanship, as it is made with the most improved machinery and tools, so as to duplicate each size perfectly in each particular part.

These machines will lift water 25 feet and force it into the boiler.

They will put water into the boiler varying in temperature up to 185°. of heat, according to amount of steam pressure carried.

The "Duplex" can be STARTED WHEN HOT, a fact which those that are versed in Injectors, or that class of boiler feeders, will admit as a decided advantage. It is not necessary to cool this machine before starting. *It is always ready.*

No. of Injector.	SIZE CONNECTIONS *Water Suction and to Boiler. Inches.*	*Steam. Inches.*	*Gallons per Hour, 60 lbs. Pressure.*	*Price.*
3	⅜	¼	65	$ 20 00
3½	⅜	¼	90	21 00
5	½	⅜	130	25 00
7	¾	½	240	30 00
9	¾	½	320	35 00
11	1	¾	560	50 00
13	1¼	1	960	60 00
15	1½	1	1280	75 00
17	1½	1¼	1760	90 00
19	2	1½	2260	110 00
21	2	1½	2860	125 00
23	2½	2	3480	150 00
25	3	2	4620	200 00

construction. we have taken special care that it should want nothing essential to an absolutely perfect Pump. It is arranged with a Revolving Top, located outside of the Water-Way, which permits of the Lever being moved to any desired position. The Cylinders are bored perfectly true, and finely polished. The attachment for connecting the Suction Pipe is both simple and complete; a substantial iron Hub projects from the bottom of the Base, on which is screwed a Coupling Nut, threaded for Gas Pipe, through which a soldering tube is introduced, for connecting to lead pipe when desired. All parts are finished to exact gauges. Repairs will always fit. Furnished with Iron or Brass Valve-Seat, as ordered.

SIZES AND PRICES.

No. 1, 2½	in.	Cylinder,	suitable	for	1	in.	Pipe, each,	$4 25
No. 2, 3	"	"	"	"	1¼	"	"	4 75
No. 3, 3½	"	"	"	"	1¼	"	"	5 25
No. 4, 4	"	"	"	"	1¼	"	"	5 75
No. 5, 4½	"	"	"	"	1½	"	"	6 25

Fitted for either Iron or Lead Pipe, or both, as ordered.
Open Top, same Price.

tillers, Wine Producers, Gas Companies, &c., and for use in all places where hot or acetious liquids are employed. As an Oil Pump it has no equal; and for water, hot or cold, it can be employed in any place where ordinary Piston Pumps are used. For pumping acids, the working parts should be made of Bronze Metal. When used for pumping hot liquor, we arrange them with metallic Check Valves, without additional expense.

We have in our employ men of large experience in the manufacture of all classes of Rotary Pumps, and have endeavored to improve them in every way which skill and experience could suggest.

SIZES AND PRICES.

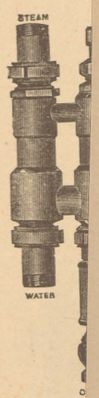
							Iron.	*Bronze.*
No. 1, 1¼	in.	Suction,	1	in.	Discharge,		$20 00	$42 00
No. 2, 1¼	"	"	1	"	"		23 00	47 00
No. 3, 1½	"	"	1¼	"	"		27 00	52 00
No. 4, 1½	"	"	1½	"	"		35 00	65 00
No. 5, 2	"	"	2	"	"		40 00	75 00

NOTE.—For convenience we use, besides our figure number, the Manufacturers' figures on all Pumps and Cylinders. In ordering designate both.

MORLEY BROTHERS

MORLEY BROTHERS

Fi



Number o	
Size of Su	
" " St	
Gals. per	
Price, eac	

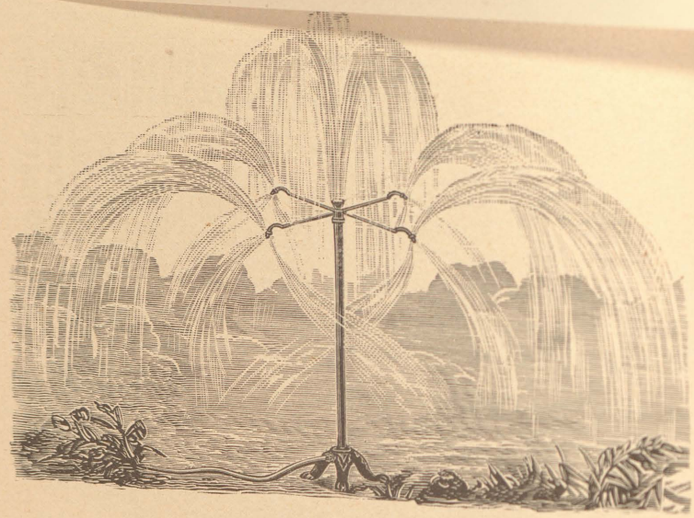
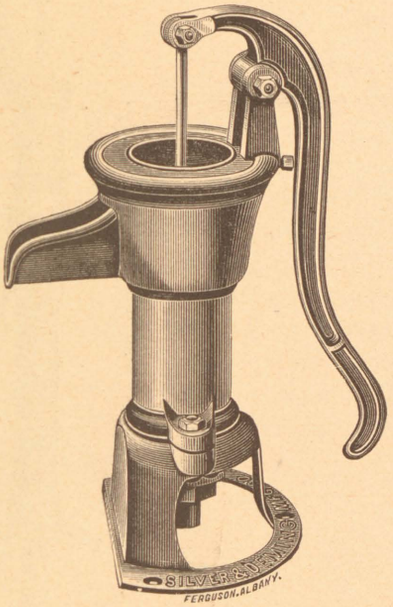


Fig. 426.

Lawn Sprinkler, four Arms, Each	$6 00
" " six " "	7 00
Globe Lawn Sprinkler, per doz	15 00

SILVER & DEMING MANUFACTURING CO'S PUMPS.

Fig. 427.



(S. & D. Fig. 125.)

NEW STYLE CLOSE-TOP PITCHER-SPOUT PUMP.

WITH ADJUSTABLE LEVER AND CUT-OFF BASE.

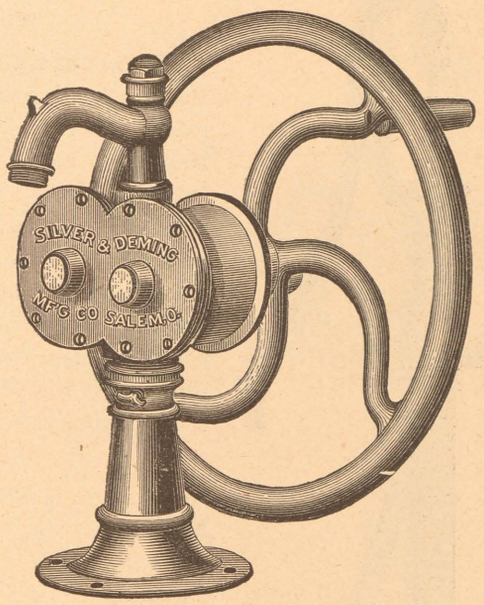
Figure 125 exhibits our improved Close-Top Pitcher-Spout Pump, a style favorably known everywhere. In its construction. we have taken special care that it should want nothing essential to an absolutely perfect Pump. It is arranged with a Revolving Top, located outside of the Water-Way, which permits of the Lever being moved to any desired position. The Cylinders are bored perfectly true, and finely polished. The attachment for connecting the Suction Pipe is both simple and complete; a substantial iron Hub projects from the bottom of the Base, on which is screwed a Coupling Nut, threaded for Gas Pipe, through which a soldering tube is introduced, for connecting to lead pipe when desired. All parts are finished to exact gauges. Repairs will always fit. Furnished with Iron or Brass Valve-Seat, as ordered.

SIZES AND PRICES.

No. 1, 2½	in.	Cylinder,	suitable	for 1	in.	Pipe, each,	$4 25
No. 2, 3	"	"	"	" 1¼	"	" "	4 75
No. 3, 3½	"	"	"	" 1¼	"	" "	5 25
No. 4, 4	"	"	"	" 1¼	"	" "	5 75
No. 5, 4½	"	"	"	" 1½	"	" "	6 25

Fitted for either Iron or Lead Pipe, or both, as ordered.
Open Top, same Price.

Fig 428



(S. & D. Fig. 575.)

HAND ROTARY FORCE PUMP.

This cut exhibits our Hand Rotary Force Pump, a Pump widely known and constantly growing in favor. It is a positive Suction and Force Pump, metallic fitted, making it especially adapted for the requirements of Brewers, Distillers, Wine Producers, Gas Companies, &c., and for use in all places where hot or acetious liquids are employed. As an Oil Pump it has no equal; and for water, hot or cold, it can be employed in any place where ordinary Piston Pumps are used. For pumping acids, the working parts should be made of Bronze Metal. When used for pumping hot liquor, we arrange them with metallic Check Valves, without additional expense.

We have in our employ men of large experience in the manufacture of all classes of Rotary Pumps, and have endeavored to improve them in every way which skill and experience could suggest.

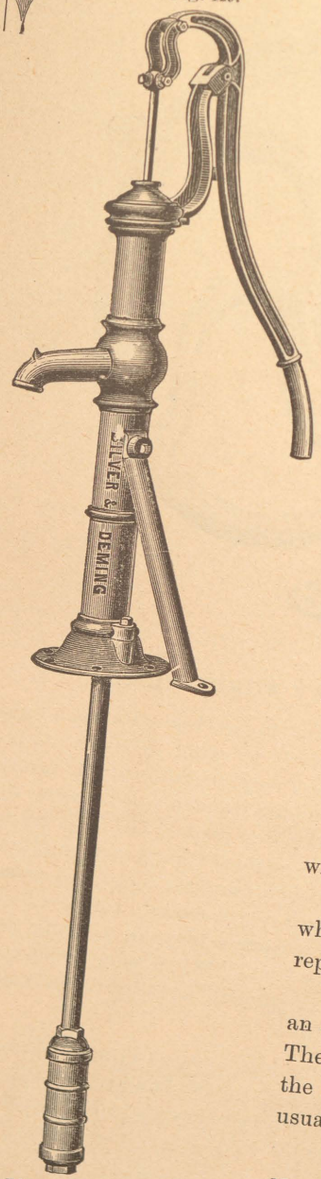
SIZES AND PRICES.

							Iron.	*Bronze.*
No. 1, 1¼	in.	Suction,	1	in.	Discharge,	.....	$20 00	$42 00
No. 2, 1¼	"	"	1	"	"	.....	23 00	47 00
No. 3, 1½	"	"	1¼	"	"	.....	27 00	52 00
No. 4, 1½	"	"	1½	"	"	.....	35 00	65 00
No. 5, 2	"	"	2	"	"	.....	40 00	75 00

NOTE.—For convenience we use, besides our figure number, the Manufacturers' figures on all Pumps and Cylinders. In ordering designate both.

SILVER & DEMING MANUFACTURING CO'S PUMPS.

Fig. 429.



TIGHT-TOP ANTI-FREEZING WELL PUMP.

(S. & D. Fig. 202.)

TIGHT-TOP ANTI-FREEZING WELL PUMP.

WITH WROUGHT IRON SET LENGTH.

Figure 202 represents our Tight-Top Anti-Freezing Well Pump. It has a closed Top, through which a polished Rod passes, and the necessary links connecting the Rod to the Handle, to prevent the rocking motion of the Rod as in open-top Pumps. Each size of this Pump is several inches taller than the corresponding size of the Open-Top. It is preferred for some locations, as no stones or dirt can be thrown into it, and the direct vertical motion of the Piston renders it less liable to require frequent repacking. It thus possesses many points of excellence, which, with its low price, make it a very popular Pump. We furnish it with Bolted Cylinder when so ordered, at same list prices.

SIZES AND PRICES.

No. 2,	$2\frac{1}{2}$	in. bore	for	$1\frac{1}{4}$	in. Suction Pipe,	$8 25
No. 3,	$2\frac{3}{4}$	"	"	$1\frac{1}{4}$	" "	8 75
No. 4,	3	"	"	$1\frac{1}{4}$	" "	9 25
No. 5,	$3\frac{1}{4}$	"	"	$1\frac{1}{4}$	" "	9 75

All our threads are cut to exact gauges, and repairs will always fit.

ANTI-FREEZING WELL PUMP, WITH BRACE.

WITH WROUGHT IRON SET LENGTH AND SCREWED BASE.

Figure 205 represents our Open-Top Drive Well Pump with Screw Base.

All sizes of this Pump have the same size Standard, which enables the merchant to carry a good assortment of repairs with a small outlay of capital.

It is handsome in design, and is made extra heavy; has an adjustable Fulcrum and Lever, and a strong Iron Brace. The Spout is large, preventing the flooding of water over the top by fast pumping. It is made anti-freezing by the usual drip hole in the Connecting Pipe.

SIZES AND PRICES.

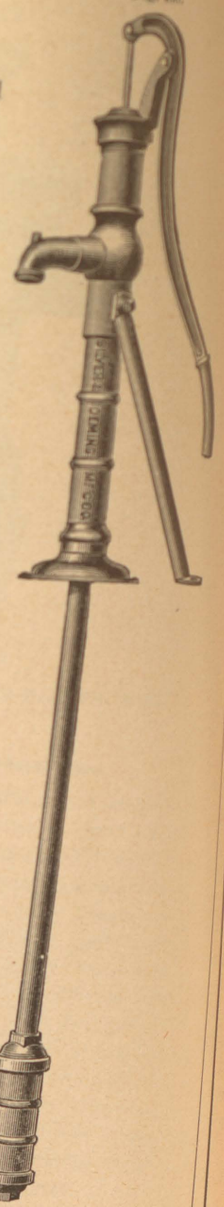
No. 2,	$2\frac{1}{2}$	in. bore,	for	$1\frac{1}{4}$	in. Suction Pipe,	$8 00
No. 3,	$2\frac{3}{4}$	"	"	$1\frac{1}{4}$	" "	8 25
No. 4,	3	"	"	$1\frac{1}{4}$	" "	8 50
No. 5,	$3\frac{1}{4}$	"	"	$1\frac{1}{4}$	" "	8 75

Length of stroke six inches. We make the above Pumps with Bolted Cylinders, when so ordered, at same List Prices.

Furnished with either Iron or Brass Valve-Seats, as ordered, but always with Iron unless Brass is specified. We guarantee exact duplicates in repairs, as all our threads are cut to exact gauges.

Deduct 25 cents from list, when ordered, without Braces.

Fig. 430.

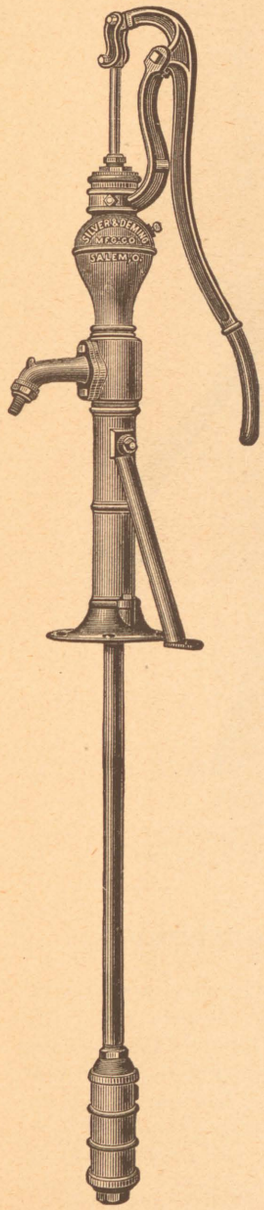


ANTI-FREEZING WELL PUMP.

(S. & D. Fig. 205.)

SILVER & DEMING MANUFACTURING CO'S PUMP.

Fig. 431.



(S. & D. Fig. 220.)
SPECIAL ANTI-FREEZING TUBE WELL FORCE PUMP.

SPECIAL ANTI-FREEZING TUBE WELL FORCE PUMP.

WITH WROUGHT IRON SET-LENGTH.

Fig. 220 represents our Anti-Freezing Tube Well Force Pump. We have taken more than ordinary pains in the construction of this Pump, and can confidently recommend it as a most excellent Force Pump, both for open and driven wells.

The Standard is the same for each Size Cylinder. The lever is long, heavy, and perfectly balanced, and is adjustable to any point most convenient for use. The piston-rod is polished, and works through a brass stuffing box. The Cylinder is located three feet below the base, and the connecting pipe is provided with the usual drip hole for allowing the water in the standard and pipe to escape in cold weather, thus rendering the pump anti-freezing.

This Pump is strongly made, is handsome in design, and is provided with a suitable brace. A spout hose coupling accompanies each Pump, and when requested we can furnish rubber hose in any quantity at manufacturers' prices.

The Cylinder is accurately bored and very highly polished. The valves are proof against sand, and the valve seats are made of either iron or brass—but always of iron (which we consider preferable), unless otherwise ordered. These Pumps are cast from metal patterns, and all threads cut to exact gauges, which insures perfect duplicates, should repairs become necessary.

SIZES AND PRICES.

No. 3—2¾	inch bore,	for	1¼	inch	Suction	Pipe	.....	$ 13 00
No. 4—3	"	"	"	1¼	"	"	"	..... 13 00
No. 5—3¼	"	"	"	1¼	"	"	"	..... 13 50
No. 6—3½	"	"	"	1½	"	"	"	..... 14 00

Standard and Cylinder only, same list price. Three feet Hose and Discharge Pipe, $3.00 extra list.

IMPROVED ANTI-FREEZING WELL FORCE PUMP.

WITH WROUGHT IRON SET-LENGTH.

Figure 221 represents a Force Pump long and favorably known to the trade. It is largely used in yards, gardens, stables, &c., and makes a very efficient fire protection, when located adjacent to private residences. On account of its strength, durability, efficiency, and cheapness, it has long been a favorite force pump; and with our superior manner of constructing it, we bespeak for it increased popularity. It is supplied with a suitable brace, and a spout-coupling for attaching hose. By lowering the Cylinder to within about 15 or 20 feet of the water it may be used in wells from 60 to eighty feet deep, although we would recommend the use of our Improved Deep Well Cylinders in connection with this Standard, for wells over 50 feet in depth.

When used as an ordinary lift pump, the nut on top of the air chamber should be loosened.

SIZES AND PRICES.

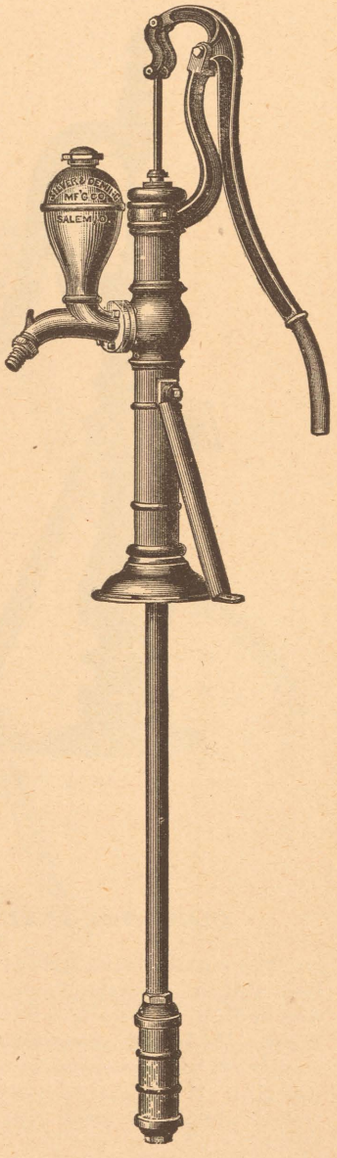
No. 3—2¾	inch bore,	for	1¼	inch	Pipe	.....	$ 15 00	
No. 4—3	"	"	"	1¼	"	"	.....	15 00
No. 5—3¼	"	"	"	1¼	"	"	.....	15 50
No. 6—3½	"	"	"	1½	"	"	.....	16 00

Standard and Cylinder only, same list price. Furnished with bolted Cylinders at same list prices.

Three feet hose and discharge Pipe, $3.00 extra list.

All threads cut to exact gauges. Repairs will always fit.

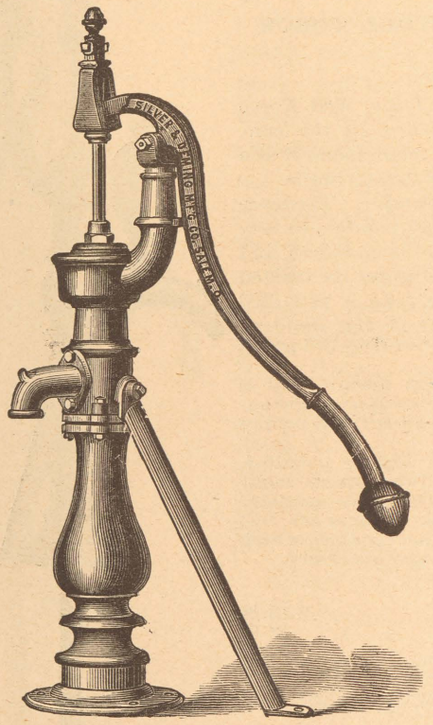
Fig. 432.



(S. & D. Fig. 221.)
IMPROVED ANTI-FREEZING WELL FORCE PUMP.

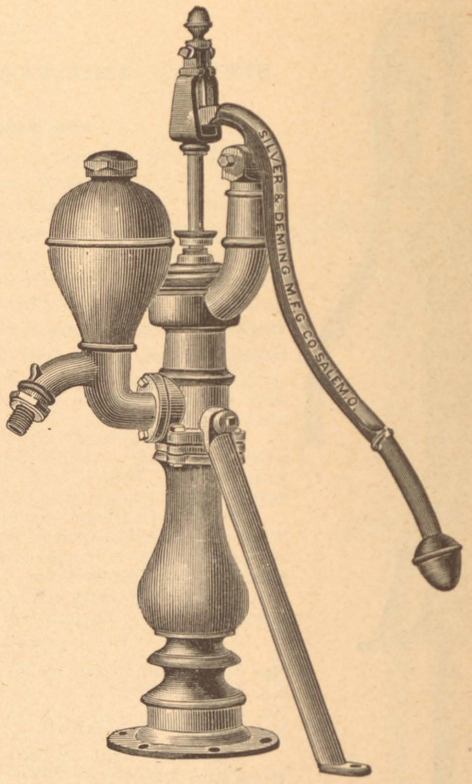
SILVER & DEMING MANUFACTURING CO'S PUMPS.

Fig. 433.



(S. & D. Fig. 230).

Fig. 434.



(S. & D. Fig. 231).

CLOSE-TOP DEEP WELL PUMP.

This cut exhibits a style of Pump Standard, which has been well and favorably known by dealers for many years. And in deep well localities it is considered the standard Pump. Its beauty, compactness, and general points of excellence, will commend it to those desiring Pumps of this class. It can be used in wells 150 feet deep. For open wells it should be used with our Improved Deep-Well Cylinders, Fig. 304, and for drilled wells with our improved Drilled-Well Cylinders, Fig. 305. Length of stroke, 7 inches.

PRICES.

Standard, comp. fitted for 1¼, 1½, 2 or 2½ Pipe, as ordered	$ 10 00
Extra Flanges, fitted for 1¼ inch Pipe, each	50
" " " " 1½, 2, or 2½ in., each	60

All parts interchangeable. Repairs will always fit.

DEEP WELL FORCE PUMP.

This Pump is constructed in the same manner as Fig. 230, with the addition of the Air Chamber and Stuffing Box necessary to make it a Force Pump. It will be found efficient in any place where a Force Pump is required.—It is a style so generally and favorably known that we need only add that we guarantee it to be the most perfect Pump of its class manufactured. It is used in connection with our Improved Deep-Well Cylinders, Figs. 304 and 305. Length of stroke, 7 inches.

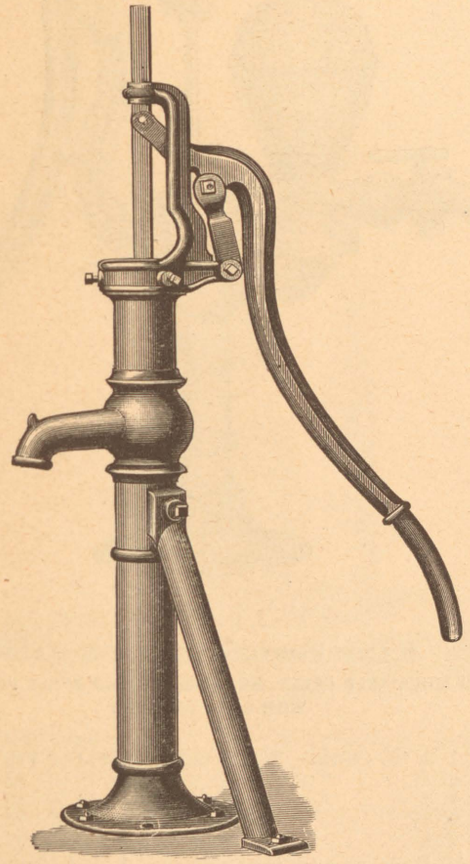
PRICES.

Standard, complete, fitted for 1¼, 1½, 2, or 2½ inch Pipe, as ordered	$ 13 00
Extra Flanges, fitted for 1¼ inch Pipe, each	50
Extra Flanges, " " 1½ or 2 inch Pipe, each	60
Extra Flanges, " " 2½ inch Pipe, each	70

☞For Cylinders see page 137.☜

SILVER & DEMING MANUFACTURING CO'S PUMPS.

Fig. 435.



(S. & D. Fig. 400.)

WIND MILL LIFT PUMP STANDARD.

This cut exactly illustrates our Figure 400. Of this Standard we make two sizes, Nos. 4 and 5. The No. 5 is made with either six or ten inch stroke, as ordered. The Connecting Pipe is attached just below the Spout, which greatly lessens the liability to injury from frost.

A Wind-Mill Attachment and Rod Coupling accompany each Pump.

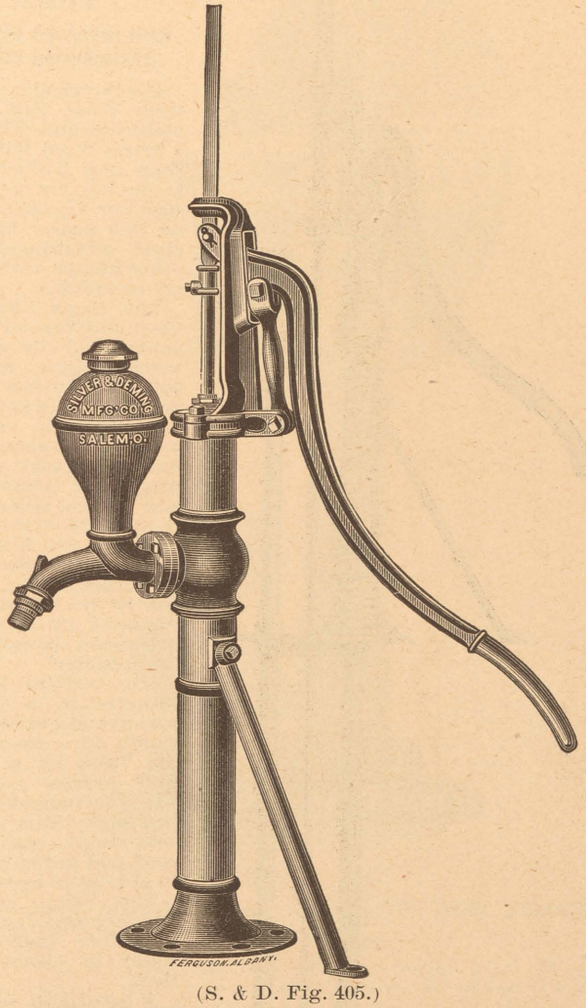
SIZES AND PRICES.

	6 *in.* Stroke.	10 *in.* Stroke.
No. 4 Standard, complete with Brace, ...	$7 00	——
No. 5 " " " "	8 00	$9 50

Fitted for 1, 1¼, 1½ or 2 inch Pipe, but always for 1¼ inch Pipe, unless otherwise ordered.

For Cylinders for this Pump see page 137.

Fig. 436.



(S. & D. Fig. 405.)

WIND MILL FORCE PUMP STANDARD.

Figure 405 represents a Force Pump Standard, embracing the usual appliances necessary for a Wind Mill Pump. In construction it is not unlike Figure 400. It has a Revolving Top, and is supported by a substantial Brace. The Connecting Pipe from the Cylinder is attached in the body of the Pump, below the Spout, making it less liable to be affected by frost. The threads are cut for either 1, 1¼, 1½ or 2 inch Pipe, but always for 1¼ inch Pipe, unless otherwise ordered.

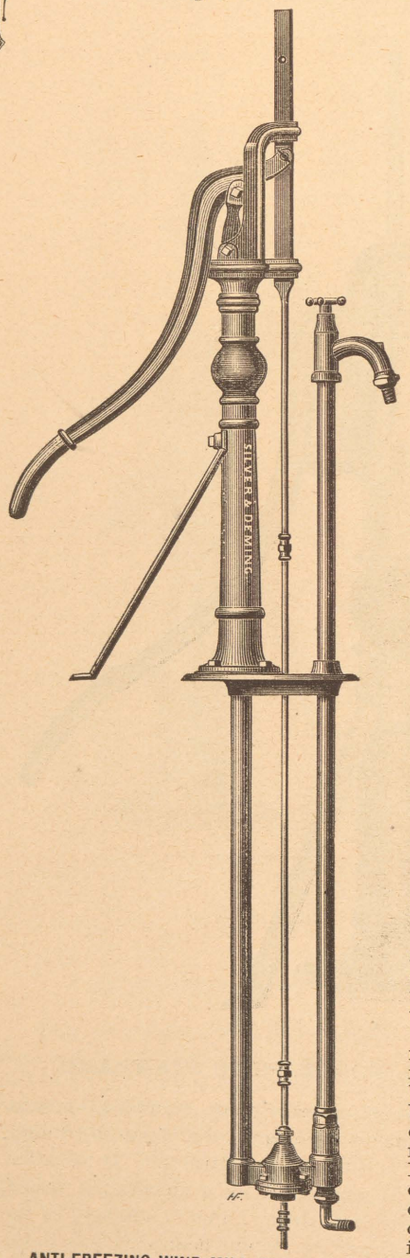
Cylinders shown on Page 137.

Fig. 405, complete as shown, 6 inch stroke, $13; 10 inch stroke, $14.50.

With Cock on Spout, $2.50 extra list.

SILVER & DEMING MANUFACTURING CO'S PUMPS.

Fig. 437.



ANTI-FREEZING WIND MILL FORCE PUMP.

(S. & D. Fig. 410.)

ANTI-FREEZING WIND MILL FORCE PUMP.

WITH IMPROVED VERTICAL DISTRIBUTING VALVE.

The increasing demand from Wind Mill Manufacturers, and others, for a better Wind Mill Pump than any heretofore made, has led us to design our Fig. 410, shown on this page. Its principal advantages over other pumps of this class are as follows:

The Brass Three-way Cock and Taper Plug are superseded by a plain vertical Valve, made of soft pure rubber, which is very elastic and durable, so carefully made that it cannot wear out, even with careless usage, for many years, and will not stick or corrode. This style of Valve is of our own invention, and much superior to any other in use. It can readily be removed and replaced by any inexperienced person in a few minutes.

The vertical Valve is actuated by a star, (or wheel) and a brass screw, which are connected to the Valve by a strong, well guided rod, the whole arrangement being impervious to frost, very simple, easily operated, and not at all liable to get out of order.

The Valve openings are very large, admitting of a free discharge of water in either direction.

A decided improvement over any other similar pump made, is the Union Coupling and Elbow on the underground discharge. By this means the handle may be turned in any direction most convenient for use, and the Elbow turned to suit the direction of the Pipe in the ditch. It also saves the purchaser the expense of a Malleable Union for each Pump. The Discharge Pipe is enlarged to 1¼ inch, and the Air Chamber Pipe to 2 inches. This gives an air chamber capacity four times as great as when a 1 inch pipe air chamber is used, insures a steady flow of water from the Spout, and relieves the Wind Mill or operator of about one-fourth of the labor required to operate the old style Pump.

We have also adapted Fig. 410 to use on 2 inch and 2½ inch Tubular Wells, and by our arrangement the Plunger may be entirely withdrawn from the Well Pipe, without removing either the Standard or Flat Rod. These improvements are to be found only in Pumps made by us.

When so ordered, we make this Pump with adjustable stroke, so arranged that the purchaser can easily adjust it to either 6, 8 or 10 inch stroke.

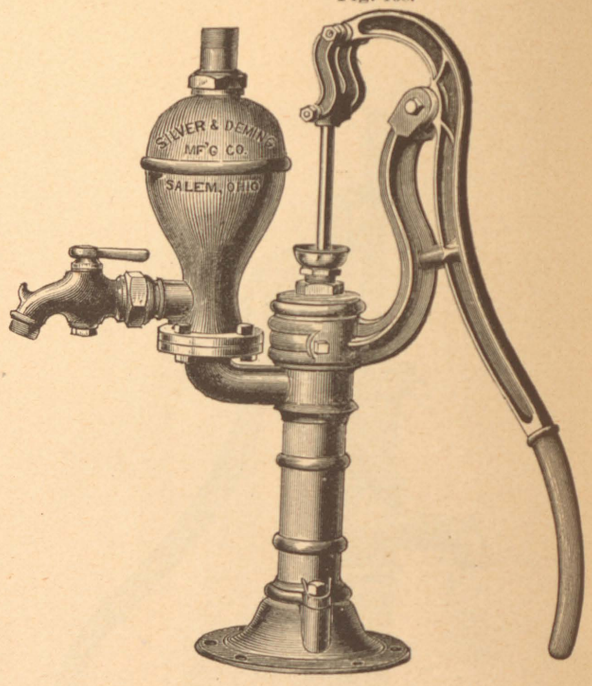
SIZES AND PRICES.

Figure 410, with 6 inch stroke, arranged to draw out Plunger, ... $18 00
Figure 410, " 10 " " " " " " 19 50
Figure 410, " adjustable stroke, " " " " " 20 50

Fitted for 1, 1¼, 1½, 2 or 2½ inch Suction Pipe, but always for 1¼ inch, unless otherwise specified.
Fitted for ¾, 1, 1¼ or 1½ inch Discharge Pipe, but always for 1 inch, unless otherwise specified.

For Cylinders to be used with this Pump, see Page 137.

Fig. 438.



(S. & D. Fig. 508.)

HAND FORCE PUMP, ON BASE.

WITH ADJUSTABLE LEVER, AIR CHAMBER, AND BRASS PISTON ROD. WITH COCK ON SPOUT.

	Iron. Br. Cyl.	*Brass*
No. 1, 2 in. Calibre, for 1¼ in. Pipe,	$11 00	$16 50 $22 00
No. 2, 2½ " " " 1¼ " "	12 50	18 00 23 50
No. 3, 3 " " " 1¼ " "	14 50	19 50 35 00
No. 4, 3½ " " " 1½ " "	21 50	29 50 43 50
No. 5, 4 " " " 1½ or 2 "	22 50	35 50 52 50

All Brass except Air Chamber, Lever, Fulcrum and Base.

The 2, 2½ and 3 inch Pumps have 6 inch stroke; the 3½ and 4 inch have 8 inch stroke.

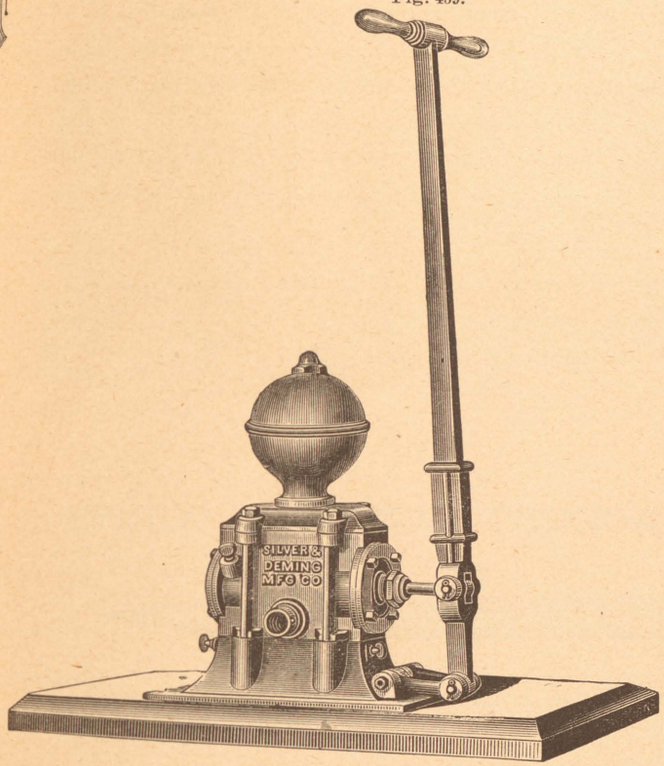
Each Pump has Brass Valve-Seat, and is fitted with Couplings below Base for both Lead and Iron Pipe. All threads cut to exact gauges; repairs will always fit.

To trip the Valve and prevent freezing, raise the Lever to its extreme height.

This Pump on plank same List Priec.

SILVER & DEMING MANUFACTURING CO'S PUMPS.

Fig. 439.



(S. & D. Fig. 601).

"TRIUMPH" HORIZONTAL DOUBLE-ACTING FORCE PUMP.

WITH COPPER LINED CYLINDER AND ADJUSTABLE LEVER.

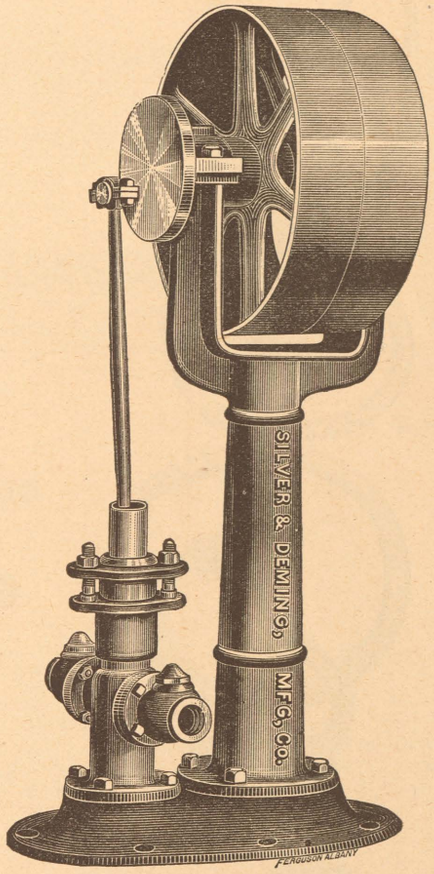
Fig. 601 represents our "Triumph" Double Acting Force Pump, on Iron Frame. The Cylinder is copper lined, the piston-rod, valves, and valve seats are bronze, and all other wearing parts exposed to the action of the liquids are rendered non-corrosive. Brass plugs are provided at each end of the bed-plate, for letting the water out of the cylinder to prevent freezing, and a similar plug may be withdrawn to prime the Pump when necessary.—The upper valves may be reached by unscrewing the brass nuts and lifting off the air chamber. The lower valves may then be reached by lifting off the body of the Pump. We fit these Pumps for iron pipe connections unless otherwise ordered, but furnish connections for either lead pipe or hose, when requested, without extra charge.

SIZES AND PRICES.

No. 1—2½ in. bore, 4½ in. stroke, 1¼ in. suction, 1 in. discharge, iron, $27; brass, $58.
No. 2— 3 in. bore, 4½ in. stroke, 1¼ in. suction, 1 in. discharge, iron, $27; brass, $58.
No. 3—4 in. bore, 4½ in. stroke, 1½ in. suction, 1¼ in. discharge, iron, $28; brass, $60.
No. 4—5 in. bore, 5 in. stroke. 2 in. suction, 1½ in. discharge, iron, $42; brass, $90.

A malleable wrench, fitting all nuts and couplings, furnished with each Pump.

Fig. 440.



(S. & D. Fig. 592).

STEAM BOILER FEED PUMP, ON BED PLATE.

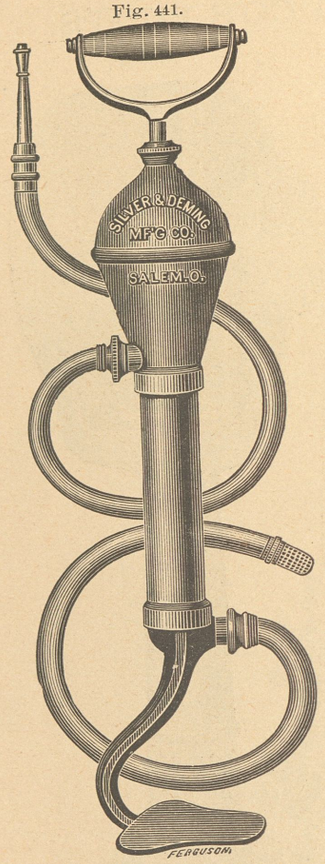
FOR HAND OR POWER.

This cut represents an improved Boiler Feed Pump on Column, with tight and loose pulleys for power. There is a strong wrought iron handle on the end of the crank shaft opposite the face plate, so that the boiler can be filled by hand when necessary. The crank shaft has a bearing on each side of the pulleys. Instead of being cast on, the check valves are bolted to the Pump, and may be readily removed when they become worn. The plungers and valves are brass, and the valve cases are iron, but when so ordered we furnish these Pumps with all brass check valves at a small additional cost, Each Pulley is provided with a set screw for fastening it to the crank shaft.

SIZES AND PRICES.

No. 1—2 in. calibre, 3 in stroke, 1 in. suction and discharge, 16 in. diam. pulley, 4 in. face.....$ 34 00
No. 2—2½ in. calibre, 3 in. stroke, 1 in. suction and discharge, 16 in. diam. pulley, 4 in. face..... 40 00
No. 3—3 in, calibre, 3 in. stroke, 1¼ in. suction and discharge, 16 in. diam. pulley, 4 in. face..... 50 00
No. 4—2 in. calibre, 6 in. stroke, 1¼ in. suction and discharge, 18 in. diam. pulley, 4 in. face..... 65 00
No. 5—2½ in. calibre, 6 in. stroke, 1¼ in. suction and discharge, 18 in. diam. pulley, 4 in. face..... 75 00
No. 6—3 in. calibre, 6 in. stroke, 1½ in. suction and discharge, 18 in. diam. pulley, 4 in. face..... 85 00

Fig. 441.



(S. & D. Fig. 660.)

PORTABLE GREEN HOUSE PUMP.

Cut 441 represents a Portable Hand Force Pump, which is held in great favor and generally used about private residences, warehouses and public buildings of this and almost every other country. It is especially adapted for use in green houses, about stables for washing carriages, and is of more than ordinary value in cases of incipient fires. It is light and easily handled, weighing only eight pounds, and the low price places it within the reach of all who may require such a pump.

Fig. 660, with 2½ feet Suction and 3 feet Leading Hose, Brass Discharge Pipe and Sprinkler ..... $ 9 00

Extra for Conical Tip to use in forcing out pipe 1 00

BRASS JACKET DRIVE WELL POINTS.

Fig. 443.

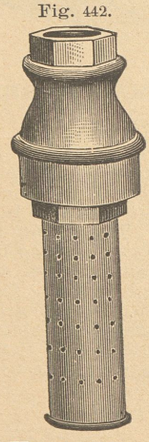
Diameter of Pipe.	Length of Pipe.	Holes and Price.	Holes and Price.	Holes and Price.	Holes and Price.
1¼ inch.	24 inch.	80 $ 4 00	100 $ 4 50	120 $ 5 00	
1¼ inch.	30 inch.	80 5 00	100 5 50	120 6 00	140 $ 6 50
1¼ inch.	36 inch.	100 6 00	120 6 50	140 7 00	160 7 50
1¼ inch.	42 inch.	120 7 00	140 7 50	160 8 00	180 8 50
1½ inch.	30 inch.	80 7 50	100 8 25	120 9 00	140 9 75
1½ inch.	36 inch.	100 9 00	120 9 75	140 10 50	160 10 75
2 inch.	36 inch.	250 15 00	300 17 00	350 19 00	
2 inch.	48 inch.	300 20 00	350 22 00	400 24 00	

Add following net prices to net prices of Points with No. 50 Gauze to get prices of those with finer Gauze:

	Nos. 60.	80.	90.
1¼x24 in	$ 0 30	$ 0 40	$ 0 60
1¼x30 in	40	55	80
1¼x36 in	50	70	1 00

	Nos. 60.	80.	90
1¼x42 in	$ 0 60	$ 0 80	$ 1 20
1½x30 in	45	70	95
1½x36 in	60	80	1 15

Fig. 442.



Improved Vertical Iron Check and Foot Valve.

GAS PIPE SIZES, INCHES.

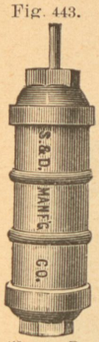
¾	1	1¼	1½	2	2½	3
1.75	2.00	2.25	2.50	3.00	3.50	4.50

The working of a Pump is much improved by attaching one of these Valves to the lower end of the Suction Pipe, where the distance from the Cylinder to the water in the well is necessarily great, or when angles occur between the well and Pump.

SILVER & DEMING MANUFACTURING CO.'S PUMPS.

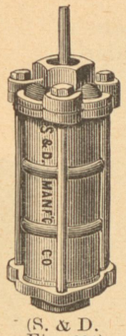
PRICE LIST OF PUMP CYLINDERS, ADOPTED DEC. 13, 1882.

Fig. 443.



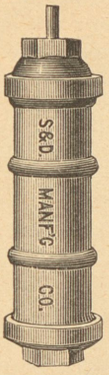
(S. & D. Fig. 300).

Fig. 444.



(S. & D. Fig. 301).

Fig. 445.



(S.&D.Fig.302).

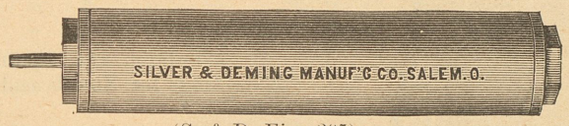
Fig. 446.

(S.&D.Fig.303).

Fig. 447.

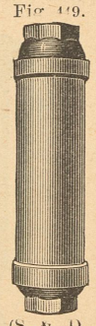
(S. & D. Fig. 304).

Fig. 448.



(S. & D. Fig. 305).

Fig. 449.



(S. & D. Fig. 312).

GAS SET CYLINDERS. "A" PLUNGER.

Figs. 300, 301.

Size.	Fitted for *	Iron.	Brass Body.	All Brass.
2 x10	1 inch Pipe,	$ 3 75	$ 7 25	$ 8 75
2¼x10	1 " "	4 00	7 50	9 00
2½x10	1¼ " "	4 35	8 00	9 50
2¾x10	1¼ " "	4 70	8 75	10 50
3 x10	1¼ " "	5 00	9 50	11 50
3¼x10	1¼ " "	5 30	10 50	12 50
3½x10	1½ " "	5 60	11 50	14 50
3¾x10	1½ " "	5 90	13 00	15 50
4 x10	2 " "	6 50	14 00	17 00

SHALLOW WELL CYLINDER. "B" PLUNGER.

Figs. 302, 303.

Size.	Fitted for *	Iron.	Brass Body.	All Brass.
2 x12	1 inch pipe,	$ 5 50	$ 10 00	$ 12 50
2¼x12	1¼ " "	5 75	10 50	13 00
2½x12	1¼ " "	6 00	11 50	14 00
2¾x12	1¼ " "	6 50	11 75	15 00
3 x12	1¼ " "	7 00	12 75	16 25
3¼x12	1¼ " "	7 50	14 00	17 50
3½x12	1½ " "	8 00	15 50	20 00
3¾x12	1½ " "	8 50	18 00	23 50
4 x12	2 " "	9 25	21 50	27 00
2 x14	1 " "	6 00	10 25	13 00
2¼x14	1¼ " "	6 25	11 25	14 00
2½x14	1¼ " "	6 50	11 75	14 50
2¾x14	1¼ " "	7 00	12 50	15 75
3 x14	1¼ " "	7 50	13 50	16 75
3¼x14	1¼ " "	8 00	15 00	18 25
3½x14	1½ " "	8 50	16 50	21 50
3¾x14	1½ " "	9 00	20 25	25 00
4 x14	2 " "	10 00	23 75	29 50
4½x14	2 " "	12 50	26 00	34 00
5 x14	2½ " "	14 25	29 00	39 00

DEEP WELL CYLINDERS. "C" PLUNGER.

Figs. 304, 305.

Size.	Fitted for *	Iron.	Brass Body.	All Brass,
1½x16	1 inch pipe,	$ 6 00	$ 10 50	$ 13 50
1¾x16	1 " "	6 00	10 50	13 50
2 x16	1 " "	6 00	10 50	13 50
2¼x16	1¼ " "	6 50	12 00	15 00
2½x16	1¼ " "	7 00	12 50	15 00
2¾x16	1¼ " "	7 50	13 00	16 25
3 x16	1¼ " "	8 00	14 00	17 50
3¼x16	1¼ " "	8 50	16 00	20 00
3½x16	1½ " "	9 00	18 50	23 40
3¾x16	1½ " "	9 50	22 50	27 50
4 x16	2 " "	10 50	26 00	32 50
4½x16	2 " "	13 00	30 00	40 00
5 x16	2½ " "	15 50	35 00	48 00
6 x16	3 " "	22 00	41 00	60 00

The Brass Body and all Brass Cylinders in the above lists are made of Cast Brass.

* Fitted for other sizes of Pipe when so ordered.

SPECIAL SEAMLESS BRASS TUBE WIND MILL CYLINDERS.

Fig. 312. 10 in. or 10½ in. long. "F" Plunger.

	Iron Att.	All Brass.
2 inch, fitted for 1 inch Pipe.....	$ 7 50	$ 8 25
2¼ " " 1¼ " "	7 75	8 50
2½ " " 1¼ " "	8 00	8 75
2¾ " " 1¼ " "	8 50	9 25
3 " " 1¼ " "	9 00	10 00
3¼ " " 1¼ " "	9 75	10 75
3½ " " 1½ " "	10 50	12 00
3¾ " " 1½ " "	11 75	13 25
4 " " 2 " "	14 00	16 00

Fig. 312. 12 in. long. "F" Plunger.

	Iron Att.	All Brass,
2 inch, fitted for 1 inch Pipe.....	$ 8 00	$ 9 00
2¼ " " 1¼ " "	8 25	9 25
2½ " " 1¼ " "	8 50	9 50
2¾ " " 1¼ " "	9 00	10 00
3 " " 1¼ " "	9 50	11 00
3¼ " " 1¼ " "	10 25	11 75
3½ " " 1½ " "	11 25	13 50
3¾ " " 1½ " "	12 75	15 75
4 " " 2 " "	15 00	18 50

Fig. 312. 14 in. long. "B" Plunger.

	Iron Att. and Follower. Brass Cage and Valve.	All Brass.
2 inch, fitted for 1 inch Pipe.....	$ 8 50	$ 11 25
2¼ " " 1¼ " "	9 00	11 75
2½ " " 1¼ " "	9 25	12 00
2¾ " " 1¼ " "	9 75	13 00
3 " " 1¼ " "	10 25	13 50
3¼ " " 1¼ " "	11 00	14 50
3½ " " 1½ " "	12 25	16 25
3¾ " " 1½ " "	13 75	18 50
4 " " 2 " "	15 75	21 50
4½ " " 2 " "	18 00	26 00
5 " " 2½ " "	20 50	30 50
6 " " 3 " "	24 00	40 00

Fitted with Inside Attachments at same list prices when so ordered.

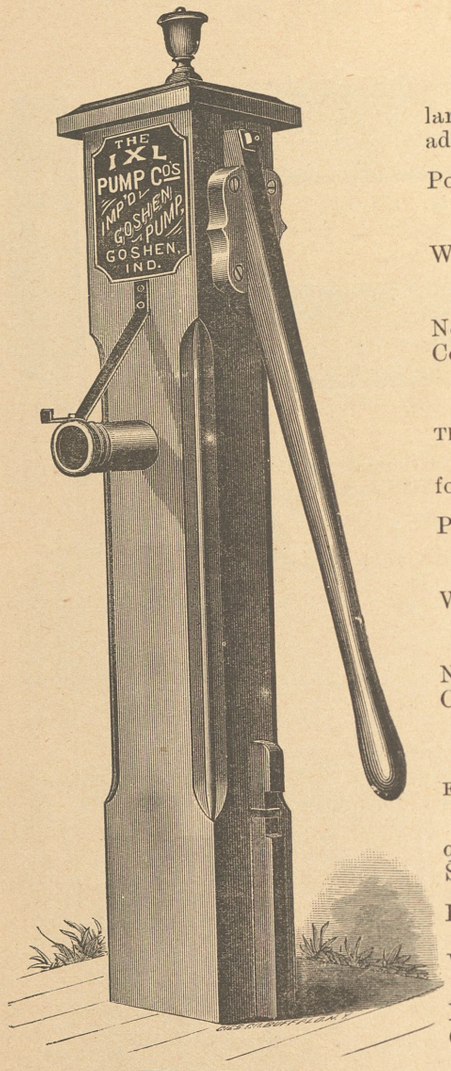
We can furnish Iron Body Brass Lined Cylinders, all the above sizes, at same list.

Fig. 312—10 and 12 inches long, fitted with "F" Plungers; 14 inches long fitted with "B" Plungers.

We can furnish the above Cylinders with Inside Attachments for Drilled Wells at same list prices when so ordered.

THE IXL PUMP CO.'S PATENT PORCELAIN LINED PUMPS.

Fig. 450.



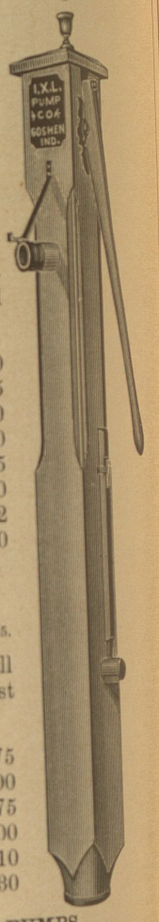
NO. 0 STOCK PUMPS.

4 Inch Cylinder. Made from Timber 7x7.

These Pumps are designed for general use where a large quantity of water is desired and are particularly adapted to the wants of farmers and stock men.

Porcelain lined, 6 ft. long	$ 7 20
" " 7 "	7 70
" " 8 "	8 20
Without lining, 6 "	5 20
" " 7 "	5 70
" " 8 "	6 20
No. 1 Tubing, 4x4, 1¾ in. bore, per foot	12
Couplings for Nos. 0 and 1 Tubing, welded bands	40

Fig. 451.



NO. 2 PUMPS.

The Favorite House Pump, 3½ in. Cylinder. Made from timber 6x6.

This is the "standard" pump, and is recommended for house wells and large cisterns.

Porcelain lined, 6 ft. long	$ 6 50
" " 7 "	6 85
" " 8 "	7 20
Without lining, 6 "	4 50
" " 7 "	4 85
" " 8 "	5 20
No. 1 Tubing, 4x4, 1¾ in. bore, per ft.	12
Couplings, with welded bands	40

NO. 3 PUMPS.

For Shallow Wells and Cisterns. 3 in. Cyl. Made from Timber 5x5.

Adapted to cisterns or shallow wells, where small quantity of water is required. Has the improved Frost Slide and all modern improvements. Works very easy.

Porcelain lined, 6 ft. long	$ 5 75
" " 7 "	6 00
Without lining, 6 "	3 75
" " 7 "	4 00
No. 3 Tubing, 3½x3½, per foot	10
Couplings, with welded bands, No. 3	30

NO. 1 DRIVE WELL PUMPS.

For 1¼ or 1½ Iron Pipe. Made from Timber 6½x6½.

No. 1 Pump, Cylinder attached, 6 ft. long	$ 7 05
" " " " 7 "	7 45
" " " " 8 "	7 85

NO. 2 DRIVE WELL PUMPS.

For 1, 1¼ or 1½ Iron Pipe. Made from Timber 6x6.

No. 2 Pump, Cylinder attached, 6 ft. long	$ 6 75
" " " " 7 "	7 10
" " " " 8 "	7 45

MISCELLANEOUS ARTICLES.

Extra Plungers, complete, 4 inches, Leather, each	$ 0 75
" " " 3½ " " "	65
" " " 3 " " "	55
" " " 4 " Rubber "	75
" " " 3½ " " "	65
" " " 3 " " "	55
" Handles, any size, each	30
" Handle Links or Toggles, each	25
" Check Valves, per dozen	1 50
" Iron Spouts, Japanned, each	30
" Wood " "	15
" Spout Braces "	15
" Bands "	10
" Brackets "	30
" Bucket Woods, assorted, per dozen	3 00
" " Leathers " "	3 00

BOSTON CUPOLA AND FORGE BLOWERS.

Fig. 452.

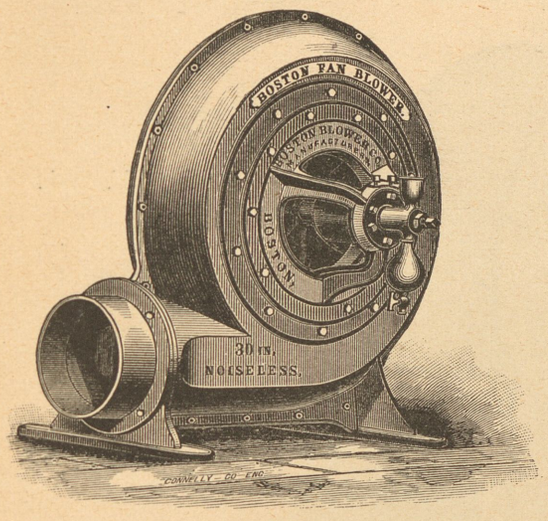
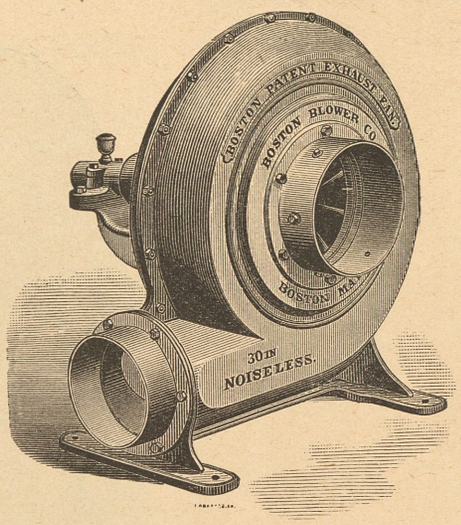


Fig. 453.



OUR BLOWERS ARE THE ONLY ONES HAVING INTERCHANGEABLE PARTS.

These Blowers are particularly adapted to Cupola Furnaces and Forges, and are, as regards material, workmanship and design, the best ever built.

All parts are made upon the interchangeable plan, so that any part can be replaced upon demand.

A two-ounce blast at a Forge will be found sufficient for most purposes.

Many Cupola Furnaces are giving good results with eight ounce blast, and some with even less, but although this may answer on Furnaces of small or medium size, we advise running the Blower at twelve-ounce speed on Furnaces of 36 inches inside diameter and upwards. On very large Furnaces even fourteen or sixteen ounces may be desirable.

An important point in the construction of our Blowers is the movable Sideplate, which may be taken off, and the Fan-wheel, Shaft and Pulleys removed or replaced without detaching Pipe or Belts, or taking the Case apart.

Another advantage is the adjustability of the Hangers at any angle required to accommodate the Belts, by simply slacking the Bolts.

Our Shafts are of excellent steel, the Fan-wheels are of the best composition and galvanized iron. The composition boxes are carefully made and highly finished throughout. They contain an admirable oiling arrangement, whereby the oil can never reach the pulleys and be thrown about, although it is obliged to travel twice the entire length of the journal before reaching the drip cup from which it can be removed at pleasure. All wear is upon an internal bushing, which can be rebabbitted or replaced when worn, as all pieces are interchangeable.

End motion is prevented by hardened steel Set Screws, which press hardened steel Runners against the ends of the Shaft. The Bearings being upon the Ball and Socket Plan, these Blowers can be run equally well bottom up, or in any position.

Please note that we aim to build a perfect machine that is well worth its price, rather than one which is cheap in construction, and consequently so in first cost.

We guarantee each Blower to be perfect in construction, to run with as little noise as any ever built, and that no similar machine, doing the same amount of work, can be run with any less power.

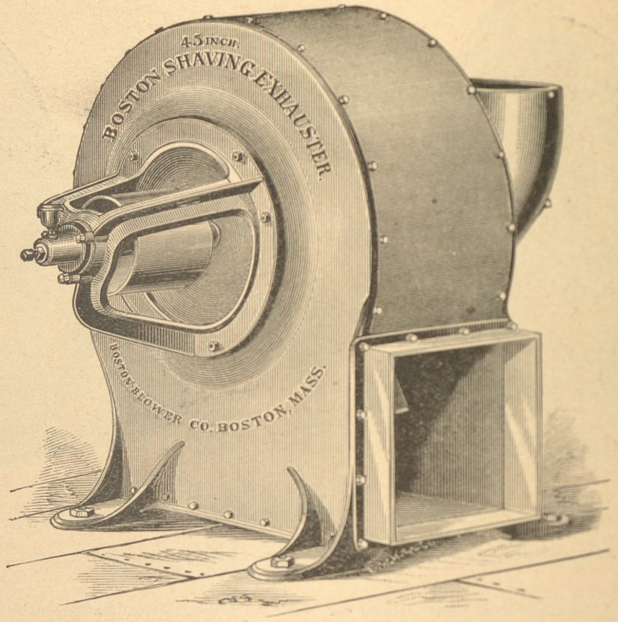
ALL DIMENSIONS ARE IN INCHES.

Sizes,	12 in.	16 in.	20 in.	24 in.	27 in.	30 in.	35 in.	40 in.	45 in.	53 in.	63 in.	77 in.
Prices, (without Countershafts)	$12	$18	$26	$36	$44	$55	$70	$90	$115	$180	$225	$325
No. Forges Blowers will supply,	1	2	3	4	5	6	10	14	20	28	40	60
Inside Diameters of Cupolas,					22	26	36	42	48	56	66	72
Forges { Speed for 2 oz. Blast,	3300	2860	2550	2300	2000	1800	1600	1400	1200	1000	900	800
" " 4 " "	4500	4000	3600	3300	2800	2500	2200	2000	1700	1400	1200	1100
Cupolas { Speed for 8 oz. Blast,					4000	3600	3200	2800	2400	2000	1800	1600
" " 12 " "						4400	3900	3500	2900	2500	2200	2000
Heights to Centres of Shafts,	7	9⅜	11	13½	14½	16¾	20	22	26	29	34¼	41¾
" " " " Outlets,	2¾	3⅝	3⅝	4¼	4⅝	6¼	7½	8	9	9¼	11¼	12½
Extreme Widths,	8	9	10¼	18⅜	21½	25¼	28½	32½	38	40½	46½	53
Centre to Centre of Pulleys,	— One	pulley	only—	7½	9	10	11¼	13½	16	18½	20¼	23¼
Outside Diameters of Outlets,	3½	4	4½	4⅞	5¼	6⅛	7⅜	8⅝	10¼	11½	13¾	17
Sizes of Pulleys,	1½x1½	2x1¾	2½x2	3x2¼	3½x3	4x3¼	4½x3¾	5x4¼	6x5¼	7x5¾	8x6¾	9x7½
Weights of Blowers, complete,	18	25	40	100	130	200	250	350	540	780	1250	1800

BOSTON SHAVING EXHAUSTERS.

THESE EXHAUSTERS HAVE INTERCHANGEABLE PARTS.

Fig. 454.



These Exhausters are especially designed for removing shavings and dust from Saws, Planers, and other Wood-working Machinery.

They are made from entirely new patterns, which include many recent improvements, and are very strongly built, having Rims of very Heavy Boiler Plate, Shafts of the best Steel, and Fan Wheels so made, of Malleable and Wrought Iron, that we guarantee them "unbreakable" by fair means.

Noise and vibration are avoided by supporting the Shaft with a Ball and Socket Bearing at each end, which insures steady motion and perfect alignment under all conditions.

The Tripod Hanger, which spans the Pulley, is capable of accurate adjustment to accommodate the Belt at any angle.

The Curved Inlet, upon the opposite side of the Machine, may be pointed in any direction, to receive the Suction Pipe.

Should the user desire to reverse the relative positions of the Hanger and Inlet, it can be done easily; hence, each Exhauster is either a Right or Left Hand Machine at pleasure.

It is frequently desirable to bolt the Exhauster to the ceiling, bottom up, and each part may be readily adjusted to work perfectly in this or in any position.

The Inlet of the Machine is unobstructed.

While the prices are very reasonable, the Exhausters are of large capacity. In operation they are almost noiseless.

These Machines, like all our other styles, are made upon the interchangeable plan, which enables us to duplicate at once any piece.

PRICES, SPEEDS, CAPACITIES AND MEASUREMENTS.—All Dimensions are in Inches.

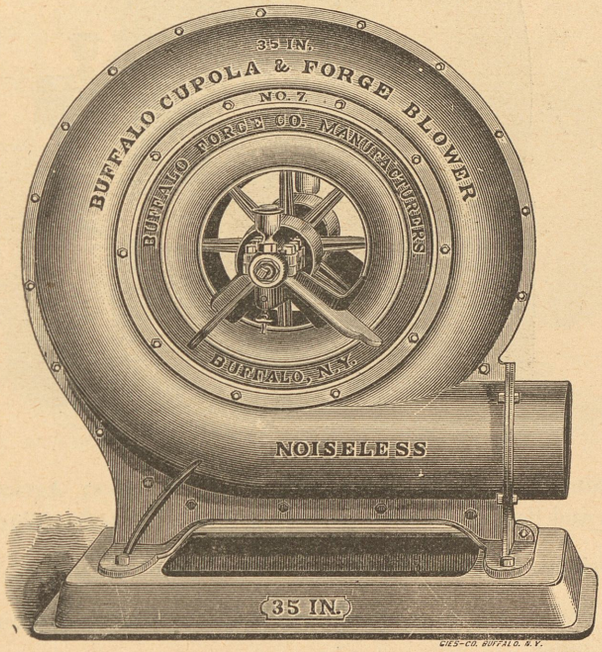
Sizes of Exhausters,	34 in.	WIDE. 34 in.	45 in.	WIDE. 45 in.	56 in.	WIDE. 56 in.	67 in.	WIDE. 67 in.
Prices (without Countershafts),	$55	$70	$95	$115	$155	$190	$225	$275
Height of Cases,	34	34	45	45	56	56	67	67
Height to Centres of Shafts,	20	20	26	26	32	32	39	39
Sizes of (rectangular) Outlets,	12x8	12x12	15x12	15x15	19x15	19x19	23x19	23x23
Diameters of Circular Pipes to fit Inlets,	13½	15	17½	19¾	22	24¾	26½	28
Extreme widths,	40	46	54	57	64½	70½	76½	81½
Extreme lengths (front to rear),	30	30	40	40	50	50	58	58
Diameters of Cases,	28	28	38	38	48	48	56	56
Sizes of Pulleys,	6x6	7x6	8x7	9x7	10x9	11x10	12x10	13x11
Speeds { From	1900	1800	1600	1400	1200	1100	1000	900
Speeds { To	2400	2200	2000	1800	1600	1400	1300	1200
Weight, complete,	350	400	650	725	1100	1300	1650	1800

BUFFALO CUPOLA AND FORGE BLOWERS.

STEEL PRESSURE BLOWERS.

MADE EXPRESSLY FOR IRON FOUNDRIES AND MACHINE SHOPS.

Fig. 455.



PRICE LIST.
With Sizes and Dimensions.

Size of Blower in inches.	No. of Blower.	Diam. of Pulley in inches.	Face of Pulley in inches.	Diameter of Outlet.	Price without Countershaft.
12	1	1¼	1½	3½	$ 12 00
16	2	2⅛	2	3⅞	18 00
20	3	2⅝	2¼	4½	26 00
24	4	3	2½	5⅛	36 00
27	5	3⅜	3	5¼	44 00
30	6	4¼	3¼	6⅛	55 00
35	7	4⅝	4	7¼	70 00
40	8	5¼	4½	8⅝	90 00
45	9	6½	5	10¼	115 00
53	10	7¼	5½	11½	180 00
64	11	8⅝	6¼	13¾	225 00
75	12	9½	7½	16	325 00

TABLE OF SPEEDS AND CAPACITIES APPLIED TO CUPOLA FURNACES.

No. of Blower.	Diam. inside of Cupola Blower will supply.	Melting Capacity, pounds per hour.	Speed.	Cubic feet of air per minute.	Pressure of Blast in ounces
4	20	1200	4200	330	5
5	26	1900	3800	513	6
6	30	2880	3400	780	7
7	35	4000	3200	1135	8
8	40	6000	3000	1692	10
9	45	8500	2900	2441	12
10	53	12000	2600	3360	14
11	65	16500	2270	4416	15
12	75	24000	2100	6464	16

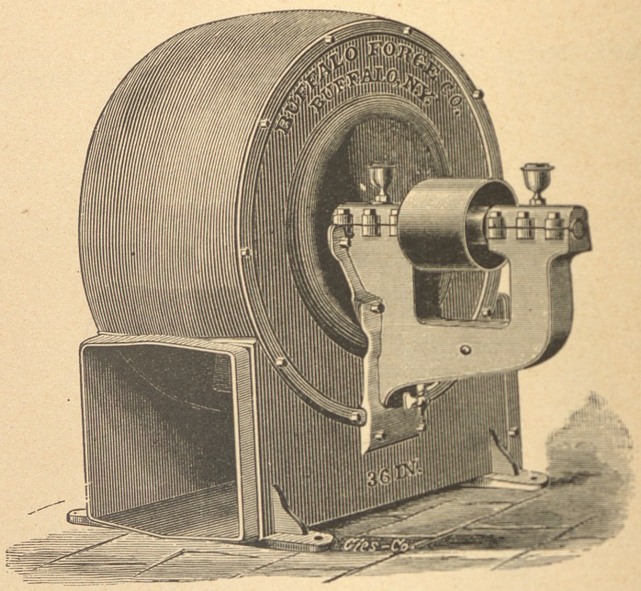
TABLE OF SPEEDS AND CAPACITIES APPLIED TO FORGE FIRES.

No. of Blower.	No. of Forge Fires Blower will supply.	Revolutions per minute, 4 ounce pressure.	Cubic feet of air.	Revolutions per minute, 6 ounce pressure.	Cubic feet of air.
1	1	4500	94		
2	2	4400	172		
3	3	4300	260		
4	5	3700	385	4500	443
5	7	3100	526	3760	633
6	10	2500	780	3010	894
7	14	2225	1010	2696	1226
8	20	1900	1442	2200	1805
9	24	1620	1852	1978	2334
10	34	1350	2602	1664	3254
11	44	1200	3367	1440	4088
12	54	1050	4322	1262	5234

In explanation of the tables of Speeds applied to Furnaces and Forge Fires, would say the number of revolutions per minute given is perfectly accurate, where four ounces pressure is desired, which will be found strong enough for most purposes. Some fires may even be run at a pressure equal to two or three ounces. Great lengths or small diameter of the Blast Pipe will require an increased speed to maintain the same amount of pressure at the Forge.

BUFFALO SHAVING EXHAUST FANS.

Fig. 456.



Made expressly for Planing Mills; Sash, Door and Blind Factories; Agricultural Implement Works; Saw Mills; Piano, Furniture, Organ and Sewing Machine Factories, and all Wooden Ware Works.

These Exhausters are designed for removing waste material from all kinds of Wood Working Machinery.

They are entirely new in design, and have fewer parts than any similar machine in the market; consequently, they are less liable to get out of order.

They are strongly built, and we guarantee them free from breakages from ordinary use.

The Fan Wheel has steel shafts, is very strongly built of the best composition brass, wrought and plate iron, and accurately balanced, so as to work noiselessly.

Both Journals are on one side, leaving the inlet entirely unobstructed, so as to allow free ingress for shavings and any long, fibrous matter.

The Reversible Mouth-piece, or outlet, is very simple and unique. The Fan can be run in either direction, and it only requires the loosening of four Bolts to change from right to left.

PRICE LIST.—WIDE PATTERN.

NUMBERS.	Size, Inches	Size of Outlet.	Size of Inlet.	Diam. of Pulley. Inches.	Face of Pulley. Inches.	Speed from and to, according to amount of work.		PRICE.
15,.....	28	$9\frac{1}{2}$ x $9\frac{1}{2}$	$10\frac{3}{4}$	$5\frac{1}{4}$	$4\frac{1}{2}$	2300	3000	$ 55 00
16,.....	32	11 x 11	$12\frac{1}{2}$	$5\frac{3}{4}$	5	2000	2600	70 00
17,.....	36	$12\frac{3}{4}$ x $13\frac{1}{2}$	15	$6\frac{1}{2}$	$5\frac{1}{2}$	1800	2400	90 00
18,.....	42	14 x 14	16	$7\frac{1}{2}$	$6\frac{1}{2}$	1600	2000	115 00
19,.....	46	17 x $17\frac{1}{2}$	18	$8\frac{1}{2}$	$7\frac{1}{2}$	1400	1800	150 00
20,.....	54	$18\frac{1}{2}$ x $18\frac{1}{2}$	20	$9\frac{1}{2}$	$8\frac{1}{2}$	1200	1600	200 00
21,.....	62	$21\frac{1}{2}$ x $21\frac{1}{2}$	24	11	9	1000	1400	250 00

COUNTERSHAFTS AND BLAST GATES.

Fig. 457.

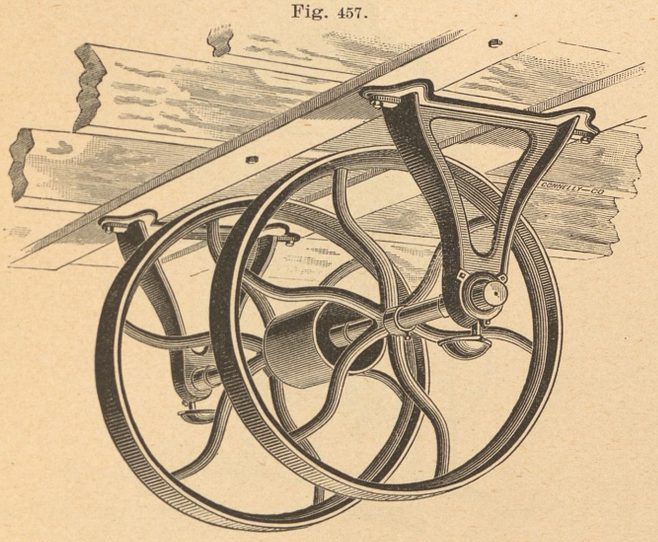
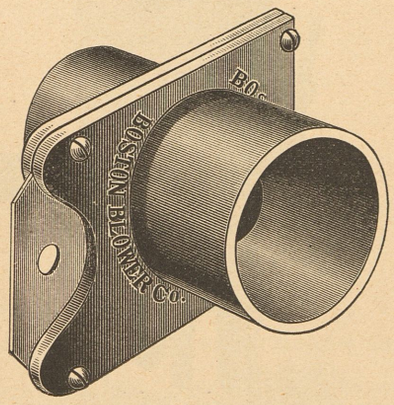


Fig. 458.



Price List of Blast Gates for Opening and Closing Pipes which supply Blast to Furnaces, Forges, &c.

1½ inch (Composition)	$ 1 25	10 inch (Iron)	$ 6 00
2 " "	1 50	12 " "	8 00
2½ " "	1 75	14 " "	10 00
3 " "	2 00	15 " "	12 00
4 " "	2 75	16 " "	15 00
5 " (Iron)	2 75	18 " "	18 00
6 " "	3 25	20 " "	20 00
8 " "	4 50	24 " "	25 00

These measurements apply to the outside of the Collars of the Blast Gate.

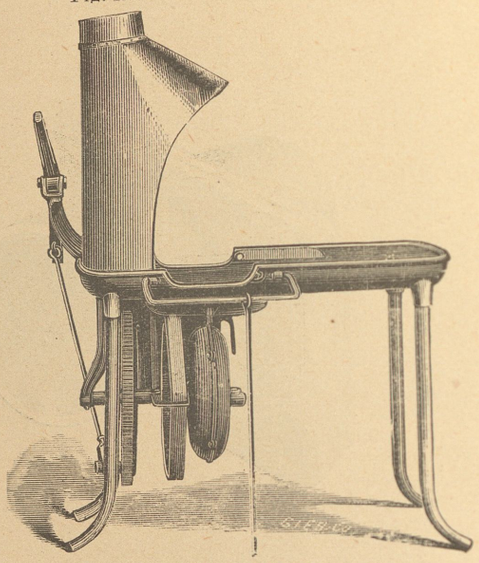
PRICES AND DIMENSIONS OF COUNTERSHAFTS.

For use with Cupola, Forge, and Fan Blowers, Exhaust Fans and Shaving Exhausters.

SIZE OF BLOWERS OR EXHAUST FANS.	Shafts.	Hangers	For Blowers. Small Pulley.	For Blowers. Large Pulley	For Exhaust Fans T.& L.Pulley.	For Exhaust Fans Large Pulley	PRICES Complete.
12 inch	1 5/16 x 14	1 5/16 x 7	3 x 2	One Only, 12x2	3x 2	12x 2	10 00
16 "	1 5/16 x 18	1 5/16 x 7	3½ x 3	One Only, 14x2	4x 2½	14x 2½	12 00
20 "	1 1/16 x 23	1 1/16 x 9	4 x 3½	One Only, 14x2¼	6x 2½	16x 2½	14 00
24 "	1 1/16 x 28	1 1/16 x 9	5 x 4	16x2¼	7x 3	18x 3	17 00
27 "	1 1/16 x 30	1 1/16 x 9	6 x 5	18x2½	7x 3	20x 3	20 00
30 "	1 7/16 x 32	1 7/16 x 12	7 x 5	20x3	8x 4	26x 3½	25 00
35 "	1 7/16 x 34	1 7/16 x 12	9 x 6	26x3½	9x 4	30x 4	30 00
40 "	1 13/16 x 38	1 13/16 x 15	10 x 7	30x4	10x 5	32x 5	35 00
45 "	1 13/16 x 43	1 13/16 x 15	11 x 8	32x5	12x 5	36x 5	40 00
53 "	1 15/16 x 48	1 15/16 x 18	12 x 9	36x5	12x 6	40x 6	55 00
63 "	1 15/16 x 53	1 15/16 x 18	14 x10	40x6	14x 8	44x 8	65 00
SHAVING EXHAUSTERS.							
34 inch	1 15/16 x 36	1 15/16 x 18			7x 6	24x 6	30 00
Wide 34 inch	1 15/16 x 36	1 15/16 x 18			8x 7	28x 7	40 00
45 inch	1 15/16 x 36	1 15/16 x 18			9x 8	32x 8	50 00
Wide 45 inch	1 15/16 x 36	1 15/16 x 18			10x 9	36x 9	60 00
56 inches	2 3/16 x 44	2 3/16 x 22			10x 9	40x 9	70 00
Wide 56 inch	2 3/16 x 44	2 3/16 x 22			11x10	44x10	85 00
67 inch	2 3/16 x 44	2 3/16 x 22			12x10	48x10	100 00
Wide 67 inch	2 3/16 x 44	2 3/16 x 22			13x11	52x11	120 00

PORTABLE FORGES.

Fig. 459.



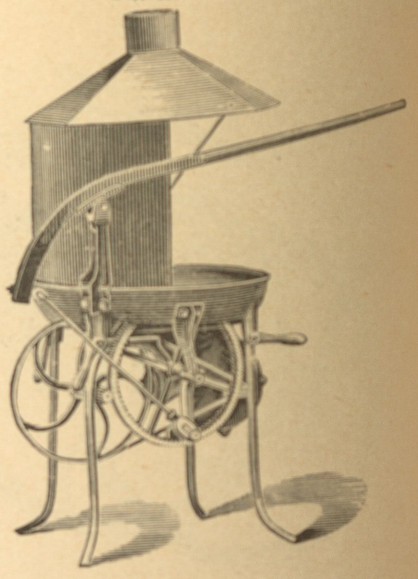
Forge No. 0. Price $50.00.

Height, 30 inches; size of hearth, 28x40 in; fan, 12 in; weight, 250 lbs.

Forge No. 0 is especially adapted for heavy blacksmith work, having a large fire-place, with sufficient blast to do heaviest kind of work; will heat 3½ to 4 in. round iron in ten minutes.

This Forge is a general favorite with carriage and wagon blacksmiths. It economizes space and time, and is much more convenient and effective than a brick forge and bellows.

Fig. 460.



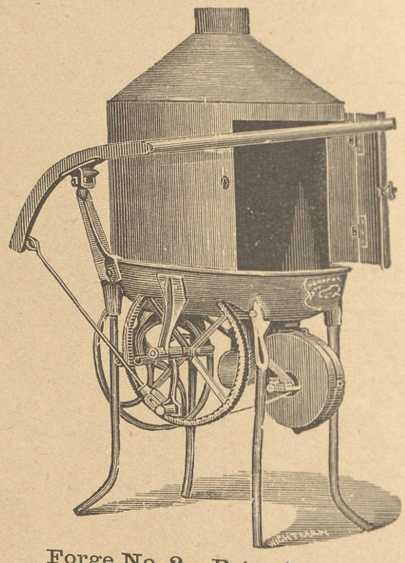
Forge No. 1, with Hood, price $40.00.

Forge No. 1, height, 29 in.; fan, 8 in.; hearth, 21x27 in.; weight 145 lbs.

Forge No. 1 will produce a welding heat on iron 2½ inches in diameter in five minutes, and on heavier iron if required. It is especially adapted for the use of machinists, railroad shops, &c.

These are the only portable forges that have no dead centre or back motion, and which have the easy motion of operating same by lever, which does not confine the operator close to the fire, as all others do.

Fig. 461.

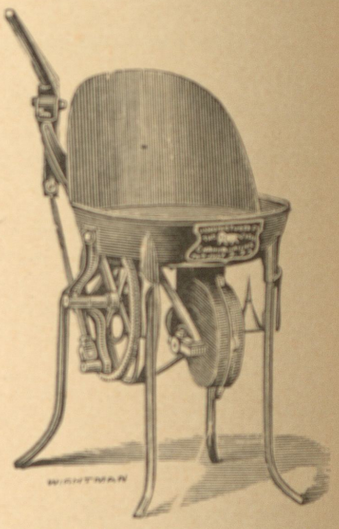


Forge No. 2. Price $42.00.

Forge No. 2, closed hood, same capacity as Blacksmiths' Forge No. 1; weight, 155 lbs.

On Forge No. 2 we place a "closed hood," which is strongly made of sheet iron, completely enclosing the fire place, and having in front a large double door for manipulating the fire, &c. The closed hood prevents the escape of sparks or fumes and smoke, and is especially adapted to the use of jewelers, dentists, locksmiths, tinsmiths, &c.; also for annealing or refining metals.

Fig. 462.



Forge No. 3, price $36.00.

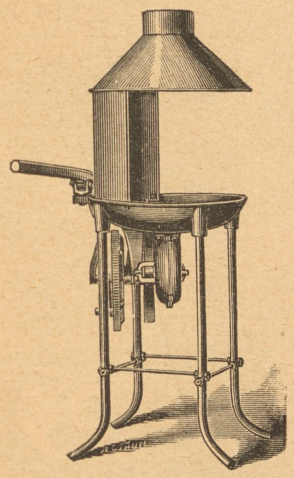
Forge No. 3, height, 29 in.; fan, 8 in.; hearth, 21x27 inches; weight, 140 lbs.

Forge No. 3 has four drop handles for convenience of moving from place to place, with deep fireplace. It is especially adapted for the use of boiler makers, iron bridge and ship builders, and a great favorite for railroads, &c.

We guarantee all our Forges and Blowers to give perfect satisfaction in every respect. More durable and economical than any other made.

PORTABLE FORGES.

Fig. 463.



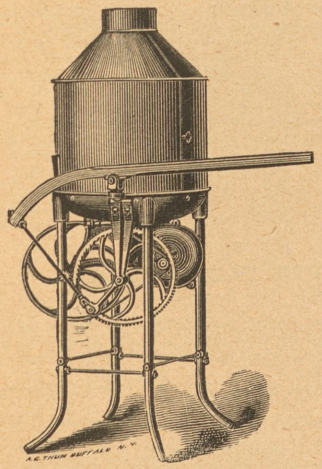
Forge No. 4, with Hood, Price $27.

Forge No. 4, half open hood, height 33 inches; size of hearth, 18 inches diameter; weight, 75 lbs.

Forges Nos. 4 and 5 will produce a welding heat on iron one and a half inch in diameter in five minutes. Heavier work can be done on either of these Forges; but on account of their size of fireplace and general capacity, they are specially recommended for work specified.

This Forge is peculiarly adapted for use of Machinists, Model Makers, Plumbers, Tinsmiths, and manufacturers in general, for heating and tempering tools of all kinds.

Fig. 465.



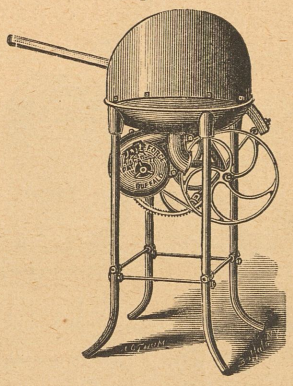
Forge No. 6, Price $30.

Forge No. 6, Closed Hood, same capacity as Blacksmiths' Forge No. 4, weight 80 lbs.

This Forge has Closed Hood, with large double doors, and is especially adapted for the use of Jewelers, Dentists, Locksmith's, Planing Mills, &c.

The most durable, compact and effective Portable Forges in use, and needed by every Farmer, Boiler Maker, Miner, Dentist, Jeweler, Plumber, Ship Builder, Bridge Builder, Steamboat and Iron Worker, &c., throughout the country.

Fig. 464.

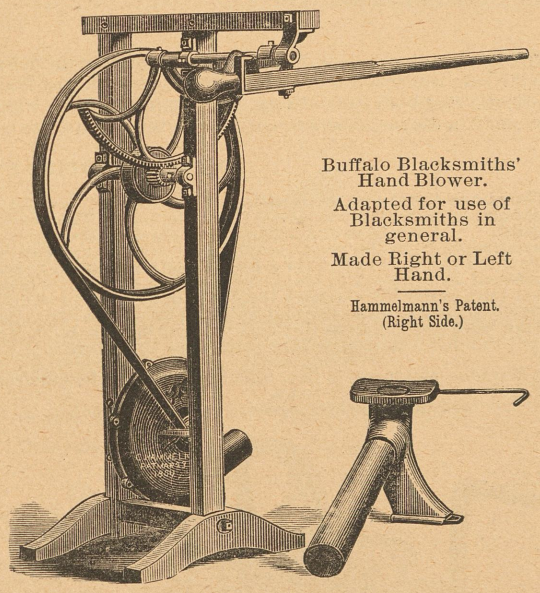


Forge No. 5, Price $24.

Forge No. 5, height 33 inches; size of hearth 18 inches diameter; weight, 70 lbs.

Forge No. 5, same capacity as No. 4, and is especially adapted for the use of Boiler Makers, Repairers, Tank Builders, Miners and Prospectors, being light, strong and compact. It is easily carried around the country.

Fig. 466.



Buffalo Blacksmiths' Hand Blower.

Adapted for use of Blacksmiths in general.

Made Right or Left Hand.

Hammelmann's Patent. (Right Side.)

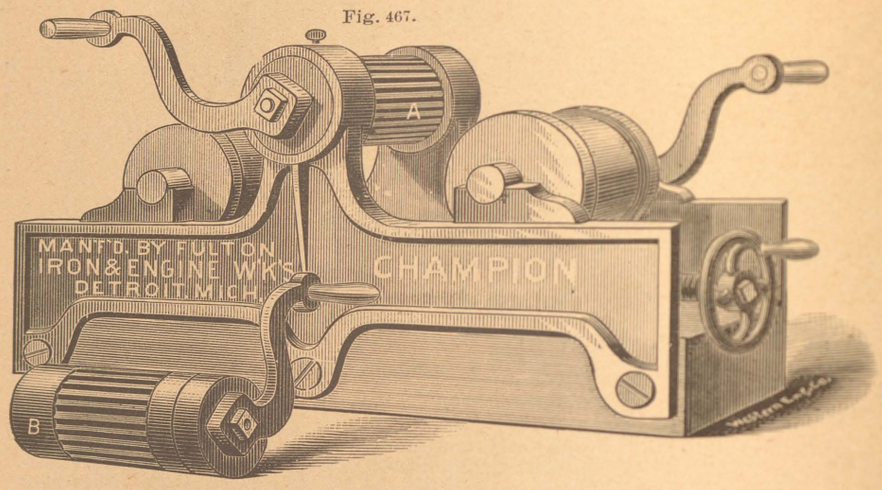
Upright Blower No. 3, Price $25, with Tuyere complete.

Upright Blower No. 3, Price $23, without Tuyere.

This Blower is of an entirely new design; the construction is so simple, the operation so easy, and the speed and efficacy so great as to be truly marvelous. It gives a strong, steady blast, with but little labor, and will heat quicker than any bellows or blowers made. It is operated by means of a lever which has the swivel motion, most natural to the blacksmith, and which does not tire him. It takes less room and has all the advantages of the old-fashioned bellows, in that the blast continues for some moments after the lever is at rest. In short it is the best, cheapest, most effective, durable and positive blower made, and is guaranteed to give perfect satisfaction in every respect if used with our Tuyere.

TIRE BENDERS AND UPSETTERS.

Fig. 467.

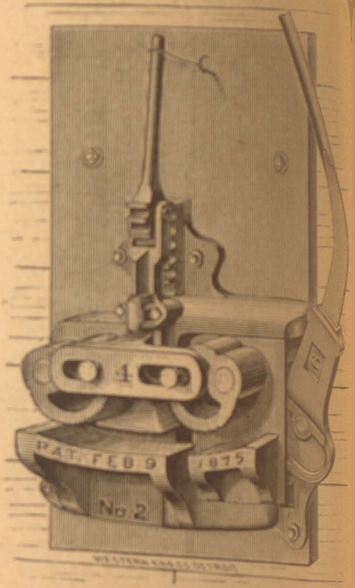


CHAMPION TIRE BENDER.

No. 1. Stationary Rollers, price..... $ 12 00
No. 2. Removable Rollers " 15 00
No. 3. Geared for 6-inch tires..... 30 00

The two bending rollers on the Champion are operated by two right hand screws, having reverse motion, and can both be adjusted to the smallest fraction of an inch by the operation of the handle on one of the screws, thus enabling the operator to bend his tire so perfectly that both ends of same will exactly meet. Flanges on bending rollers keep the tire straight. The centre roller being made small in diameter, and fluted enables the operator to bend a four inch tire with ease.

Fig. 468.



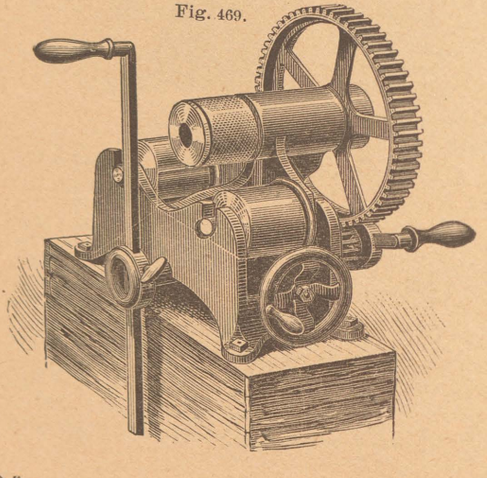
LIGHTNING UPSETTER.

DIRECTIONS FOR USING UPSETTER.

The above cut shows the position of Upsetter when set up for use. It should be bolted upright to a post or 2-inch plank, so that the opening comes about 20 inches from the floor. The bosses on the back of Upsetter should be let into the plank or post, so that it fits solid. A bar of round iron one inch in diameter by 2½ feet long must be welded to the wrought iron stub furnished with machine (straight from the bend), making the whole length of the bar not less than 4 feet, so that when in place it will stand in position represented in above cut. (For 4-inch Upsetter a bar of round iron 1¼ inch by 3½ feet long should be used. The small lever should be fastened up (by hook in plank), leaving the eccentrics raised and ready for use, as shown in cut. Heat the tire to a soft heat, place the hot part under the clamp in the opening to prevent tire from kinking. Bring down the small lever in front, so that the eccentrics are pressed firmly to the tire; let go small lever and bring down long lever and upset to amount required. Always see that your tire sets back *solid* against the back plate of the machine, and if the tire should be worn thin on one edge, as is often the case, *be sure* and put the thin edge against the back of the Upsetter.

No. 1 Machine will upset ⅛ to ¾ inch thick, and up to 2 inches wide. Price..... $ 20 00
No. 2 " " ½ to 1¼ " " " " 4 " " " 25 00
No. 3 Special 4-inch machine, price..... ..... 28 00

Fig. 469.



GREEN RIVER TIRE BENDER.

This machine will bend accurately and easily tires from the lightest to ⅝ inch thick. The circle to be made is fixed by means of a right and left hand screw, operated by the hand wheel acting equally upon the two lower rollers.

The rollers are three inches wide.

The upper roller is faced with steel and milled to insure the regular feeding through of the work.

It is powerfully geared, and 2 cranks may be used if desired. Wt. 140 lbs.

Price..... $25 00

GREEN RIVER TIRE UPSETTER.

This is the easiest worked, most durable and economical shrinker in use, and meets universal approval among our customers. It is managed by one man with perfect ease, and works equally well on the lightest steel tire and on wagon tire three inches wide.

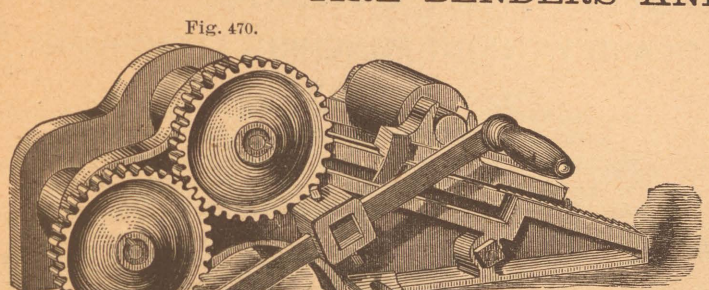
It occupies a space about two feet square on the floor. Weight, 160 lbs. The handle may be taken out of the socket when not in use.

The bolts used on the machine are steel, and are supported at both ends, so as not to spring.

Price..... $20 00

TIRE BENDERS AND UPSETTERS.

Fig. 470.

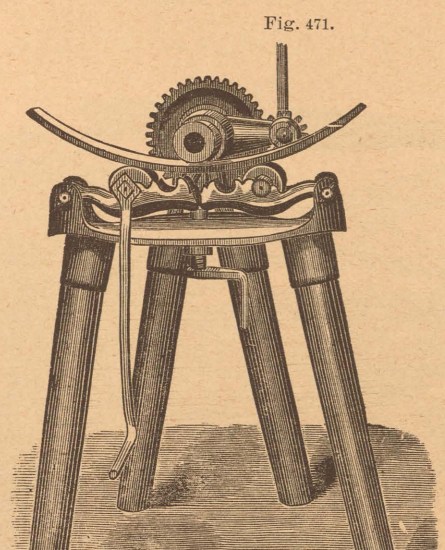


COE'S IMPROVED BENDER.

This Machine is warranted to bend 4x½ inch Tire. Its peculiar mode of construction, which enables you to adjust the rollers for the various sizes required without throwing them out of true, makes it a superior Tool.

No. 1, Price $12. Weight over 80 lbs.

Fig. 471.

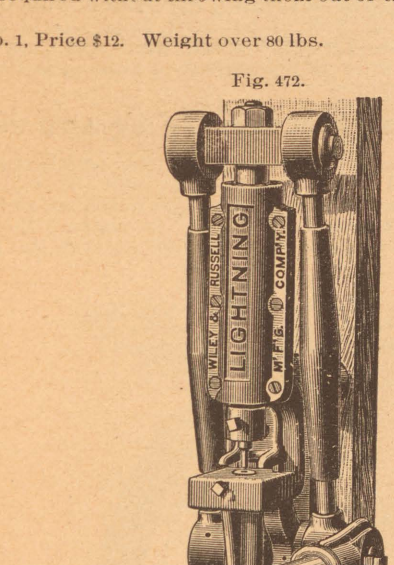


This size Machine is just right for Carriage Shops. No moving rolls to get Tire out; one Hand-screw sets both lower rolls.

Price, No. 2.....$25 00
" No. 3 ..... 32 00

No. 3 will bend 1 inch thick and 4 inches wide.

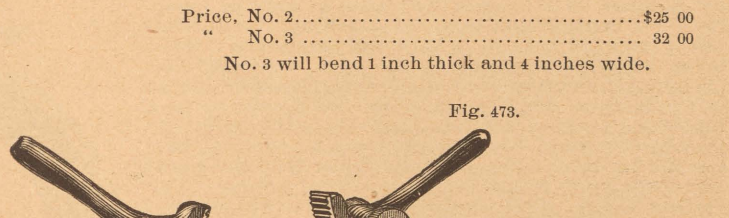
Fig. 472.



LIGHTNING PUNCHING PRESS.

Will punch ¼ inch hole in ¼ inch Iron.
With three Punches and Dies, ⅛, 3-16 and ¼ inch.
Price, $25.

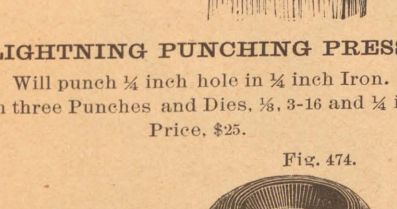
Fig. 473.



COE'S LITTLE GIANT TIRE UPSETTER.

Will shrink Tire 2x¾ inches. Price, $12.

Fig. 474.



DUCK NEST TUYERE IRONS.

No. 1, Single, Price each.....
No. 2, Double, " " .....

Fig. 475.

GREEN RIVER TIRE MEASURING WHEEL.

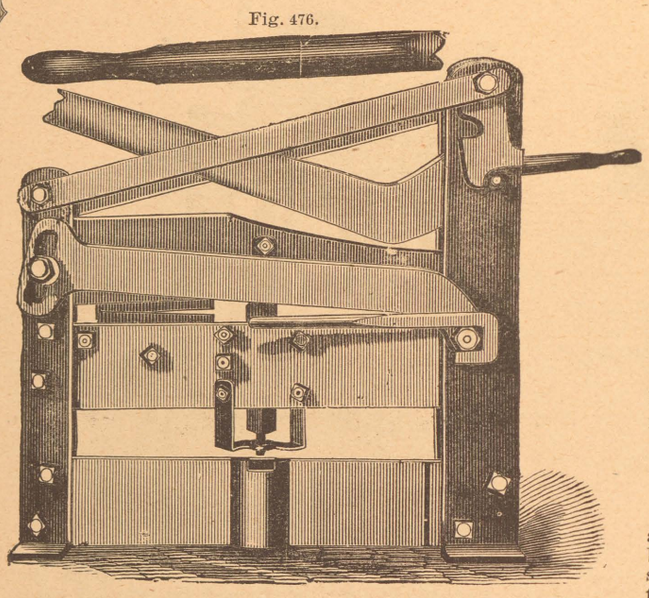
Price, $1.25.

We aim to supply Wheelwrights with a perfect running wheel, turned carefully in a lathe, and made to revolve on the points of screws so as to wear true, at a price cheaper than they can afford to make it. The index hand saves trouble of marking with chalk, and the whole, made of metal, is light, accurately fitted, handy and strong.

PATENT WROUGHT IRON SHEAR.

FOR CUTTING IRON AND STEEL. WITH AND WITHOUT PUNCHING ATTACHMENT.

Fig. 476.



No. 103 Machine will cut 6x$\frac{3}{4}$ inch flat iron, and 1$\frac{1}{2}$ inch round or square, and punch $\frac{1}{2}$ inch hole through $\frac{1}{2}$ inch iron.

No. 104 Machine will cut 6x$\frac{5}{8}$ inch flat iron, and 1$\frac{1}{4}$ inch round or square, and punch $\frac{3}{8}$ inch hole through $\frac{3}{8}$ inch iron.

No. 105 Machine will cut 6x$\frac{3}{4}$ inch flat iron, and 1$\frac{1}{2}$ inch round or square.

No. 106 Machine will cut 6x$\frac{5}{8}$ inch flat iron, and 1$\frac{1}{4}$ inch round or square.

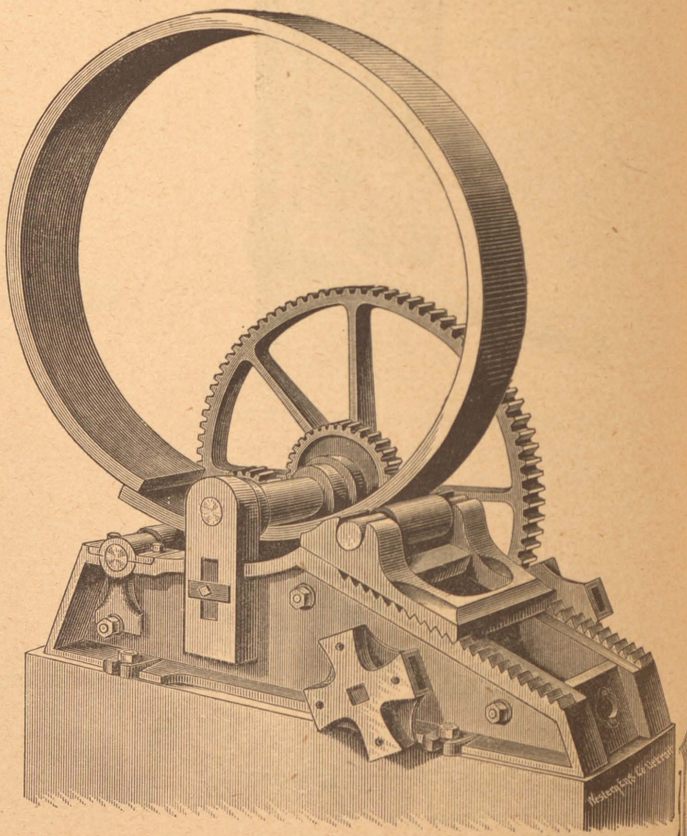
The Machines occupy a space of 8x30 inches when not in use, and when in use, further space merely sufficient to bring down the lever. They are made entirely of wrought-iron and steel, and built so strong that two men on the lever cannot injure them; can be repaired at any blacksmith shop, which makes it unnecessary to send for duplicate pieces. With fair treatment they will last a life-time, as nothing about them will wear out for years, excepting the knives, which are two pieces of plain steel, with no labor on them except the cutting edge and tempering. We sell these Machines for less money than any other on the market of same capacity.

Write us for prices.

DIRECTIONS FOR SETTING UP AND USE.

The high end of the Machine or end to which the lever is attached, should be bolted to the floor by two $\frac{1}{2}$ inch bolts or wood screws, and the front end needs but one bolt or screw, as there is no strain upon it. In cutting thick iron, the lever should be raised up at the rear so that the fulcrum pin is at the top of the L shaped slots, being held there by the latch, so as to open the blades as wide as possible. For cutting light iron and punching, the fulcrum pin of the lever must be in the lower part of the L slots, being held there by raising the latch vertically and dropping the two lower points of the latch over in front of the fulcrum pin, the bar to be cut should be in a horizontal position, not being allowed to tilt up, by adjusting the guard bar with the wrench; to do so, first put the bar to be cut in the shear, then drop the guard bar down upon it and set the nut firmly home. The cutting edges of the knives should be ground but slightly beveling, nearly square.

Fig. 477.



COE'S TIRE BENDERS.

IMPROVED NO. 3.

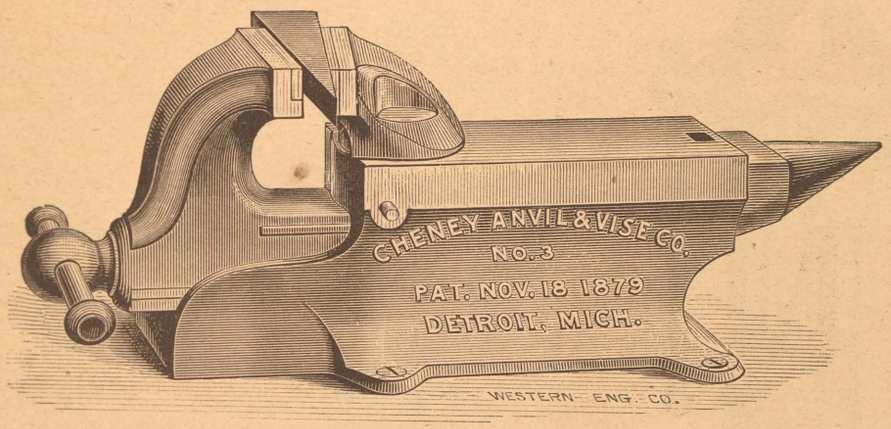
Weight, 566 lbs. Is made for heavy work. The cut represents a tire 1$\frac{1}{2}$x6 inches, bent to a circle of two feet nine inches, by two men. The rollers are made of wrought iron. The upper roller is gibbed to frame on the end when at work and the gibb is removed for the purpose of taking the tire out when bent. The movable roller can be adjusted to bend any size tire desired by the workman. The construction and strength is sufficient for a pressure of 16,000 lbs. In working the machine use wagon spokes for levers in capstans, which are more effective than common cranks. Two men that can raise 160 lbs. can work on heavy work successfully. Price, $80.

NO. 2.

Weight, 250 lbs. Can bend any size tire up to one inch by five inches wide. Constructed on same principle as No. 3, with gibb roller, which is wrought iron. Price, $40.

BLACKSMITH'S TOOLS.

Fig. 478.



CHENEY ANVIL AND VICE COMBINED.

No. 3—4 inch jaw.....$5 00 No. 4—4½ inch jaw.....$6 00

ANVILS.

Fig. 479.

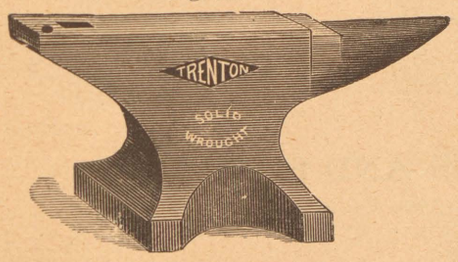
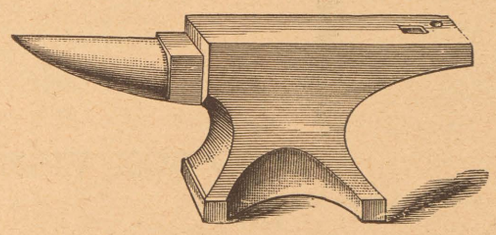


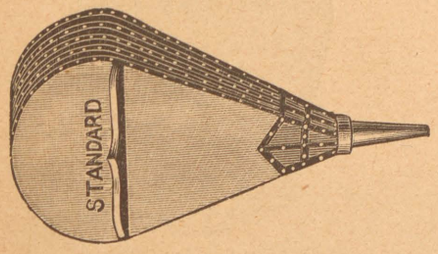
Fig. 480.



Peter Wright's, per lb.....																	
Joshua Wilkinson & Sons', per lb																	
Vulcan (steel face), No.....	00	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Weight.....	5	10	15	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Price.....	2.00	2.75	3.25	4.00	4.50	5.25	6.00	6.50	7.25	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00
Saw Makers' Anvils, per lb.....																	

BLACKSMITH'S AND HAND BELLOWS.

Fig. 481.



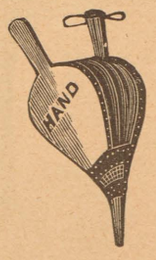
BLACKSMITH.

18 inch to 24 inch,	$ 10 00
26 "	11 00
28 "	12 00
30 "	13 00
32 "	14 00
34 "	16 00
36 "	18 00
38 "	20 00
40 "	23 00
42 "	27 00
44 "	32 00

HAND.

6 inch, per doz.....	$ 10 00
7 " "	12 00
8 " "	14 00
9 " "	16 00
10 " "	18 00
11 " "	20 00
12 " "	24 00

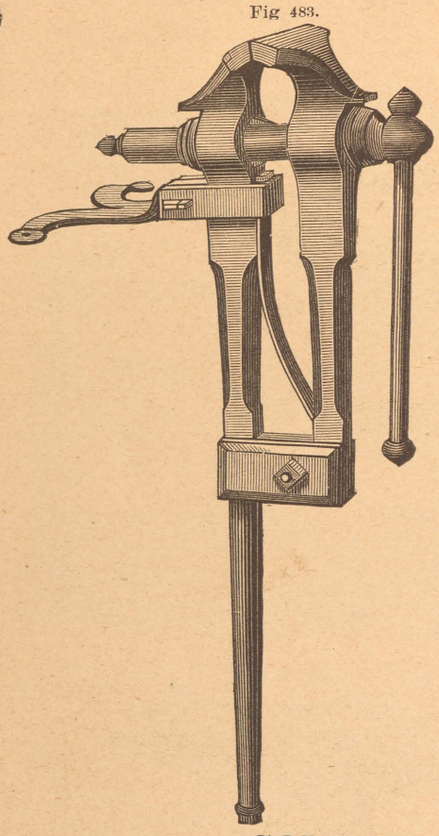
Fig. 482.



No Standard Bellows made larger than 44 inches.

SOLID BOX VISE.

Fig 483.



PRICE LIST.

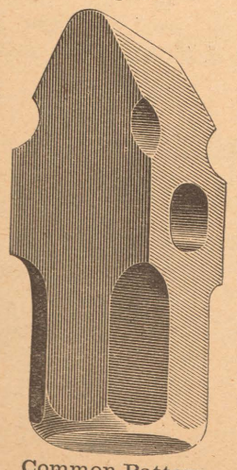
No.	35.	Vise with jaw	$3\frac{3}{4}$	inch ..... $ 8 00
	40.	" "	4	" 9 00
	45.	" "	$4\frac{1}{4}$	" 10 00
	50.	" "	$4\frac{1}{2}$	" 11 00
	55.	" "	$4\frac{3}{4}$	" 12 00
	60.	" "	5	" 13 00
	65.	" "	5	" 14 00
	70.	" "	$5\frac{1}{4}$	" 15 00
	75.	" "	$5\frac{1}{4}$	" 16 00
	80.	" "	$5\frac{1}{2}$	" 17 50
	85.	" "	$5\frac{1}{2}$	" 18 50
	90.	" "	$5\frac{3}{4}$	" 20 00
	95.	" "	$5\frac{3}{4}$	" 21 00
	100.	" "	6	" 22 00
	105.	" "	6	" 23 00
	110.	" "	6	" 24 00
	115.	" "	6	" 25 00
	120.	" "	$6\frac{1}{2}$	" 26 00
	125.	" "	$6\frac{1}{2}$	" 27 50
	130.	" "	$6\frac{1}{2}$	" 29 00
	135.	" "	$6\frac{1}{2}$	" 31 50
	140.	" "	7	" 33 00
	145.	" "	7	" 35 00
	150.	" "	7	" 36 00
	160.	" "	$7\frac{1}{4}$	" 41 50
	170.	" "	$7\frac{1}{4}$	" 44 50
	180.	" "	$7\frac{1}{2}$	" 47 00
	190.	" "	$7\frac{3}{4}$	" 53 00
	200.	" "	8	" 56 00

SOLID BOX VISE BOXES AND SCREWS.

No. 1.	For Vises from No. 35 to 40	$ 3 50	No. 4.	For Vises from No. 90 to 130	$ 6 50
No. 2.	" " 45 to 60	4 00	No. 5.	" " 135 to 200	8 00
No. 3.	" " 65 to 85	4 50			

SLEDGES.

Fig. 484.

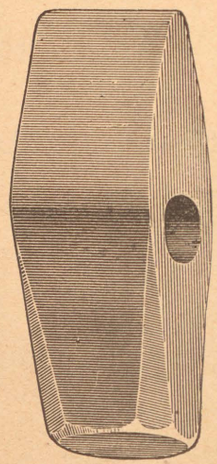


Common Pattern.

Steel Face, per lb.....

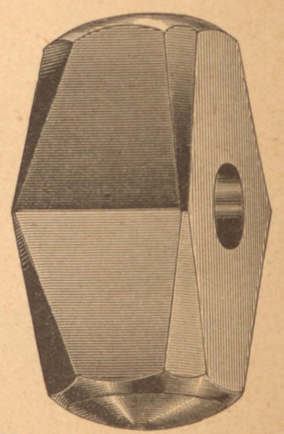
Solid Cast Steel, per lb.....

Fig. 485.



New England Pattern.

Fig. 486.

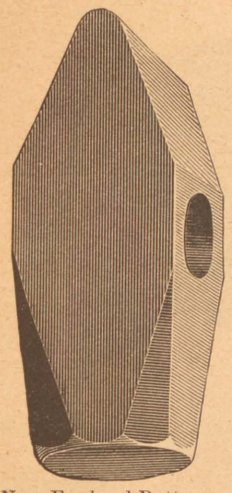


Horseshoe Turning Sledge.

Solid Cast Steel, per lb.....

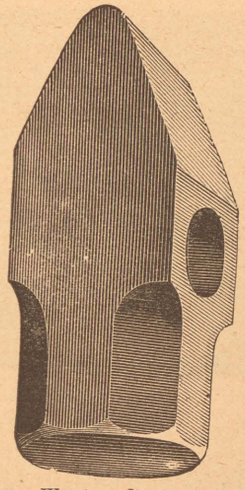
HAMMERS, SLEDGES, &c.

Fig. 487.



New England Pattern.

Fig. 488.

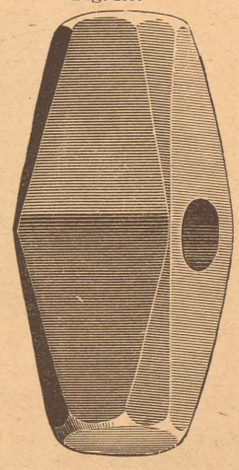


Western Pattern.

BLACKSMITHS' HAND HAMMERS.

Steel Face, per lb.....
Solid Cast Steel, per lb.....

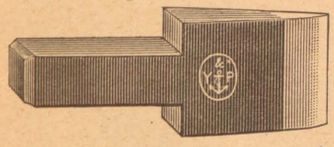
Fig. 489.



STRIKING HAMMERS.

Steel Face, per lb.....
Solid Cast Steel, per lb.....

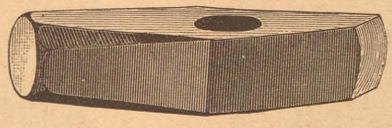
Fig. 490.



HARDIES.

Per lb.....

Fig. 491.



CREASERS.

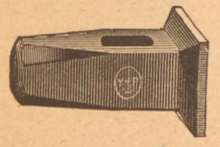
Per lb.....

Fig. 492.

SET HAMMERS.

Per lb.....

Fig. 493.



FLATTERS.

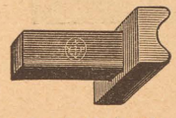
Per lb.....

Fig. 494.

TOP SWAGES.

Per lb.....

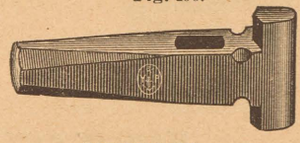
Fig. 495.



BOTTOM SWAGES.

Per lb.....

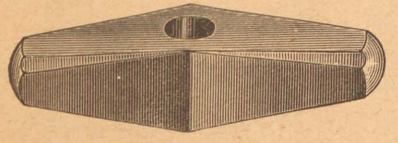
Fig. 496.



TOP FULLERS.

Per lb.....

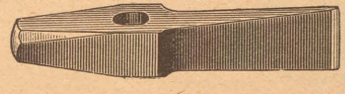
Fig. 497.



NAPPING HAMMERS.

Steel Face, per lb.....
Solid Cast Steel, per lb .....

Fig. 498.



HOT CHISELS.

Per lb.....

Fig. 499.

COLD CHISELS.

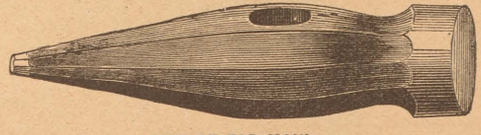
Per lb.....

Fig. 500.

COAL SLEDGES.

Steel Face. per lb.....
Solid Cast Steel, per lb.....

Fig. 501.



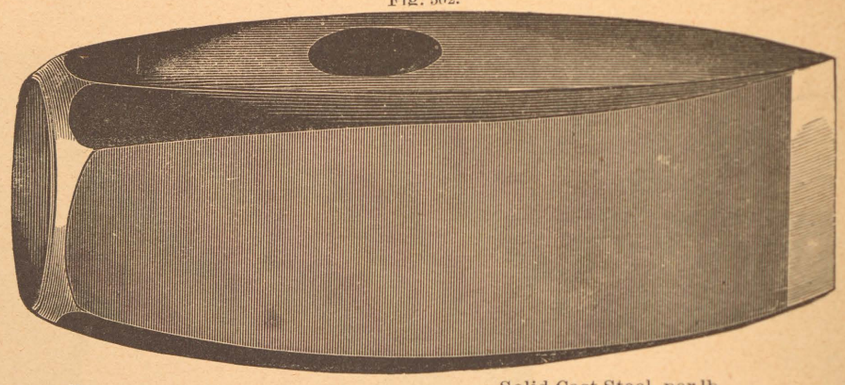
SHIP OR TOP MAUL.

Steel Face. per lb.....
Solid Cast Steel, per lb.....

SLEDGES AND HAMMERS.

STONE SLEDGES.

Fig. 502.

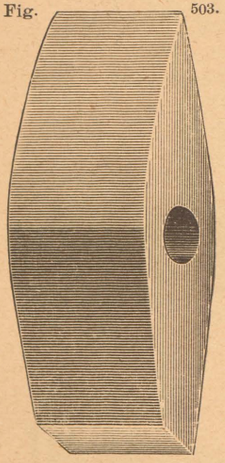


Steel Face, per lb.,.....

Solid Cast Steel, per lb.,.....

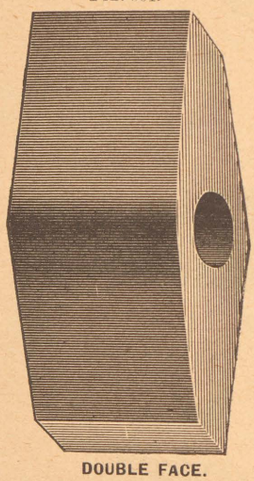
SPAULING OR STONE HAMMERS.

Fig. 503.



FACE AND PEIN.

Fig. 504.



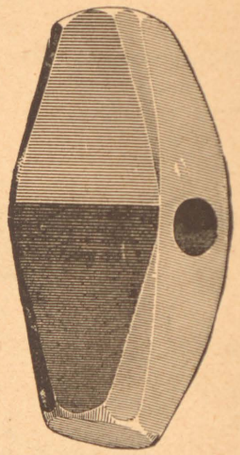
DOUBLE FACE.

Steel Face, per lb.,.....

Solid Cast Steel, per lb.,.....

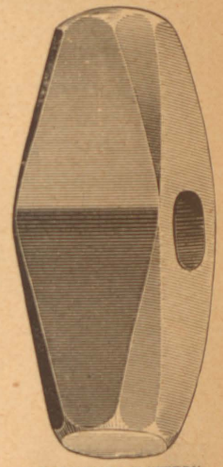
HAND DRILLING OR STONE CUTTERS' HAMMERS.

Fig. 505.



NEW ENGLAND PATTERN.

Fig. 506.



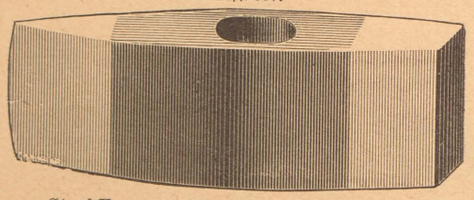
COLORADO PATTERN.

Steel Face, per lb.,.....

SolidCast Steel, per lb.,.....

MASONS' HAMMERS.

Fig. 507.

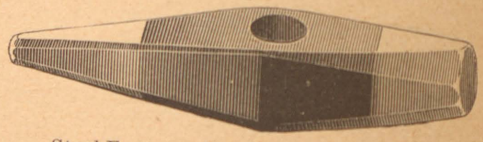


Steel Face, per lb.,.....

Solid Cast Steel, per lb.,.....

RAILROAD SPIKING HAMMERS.

Fig. 508.

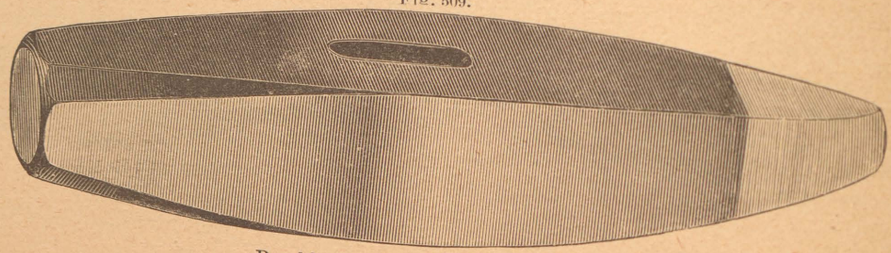


Steel Face, per lb.,.....

Solid Cast Steel, per lb. .....

RAILROAD TRACK CHISELS.

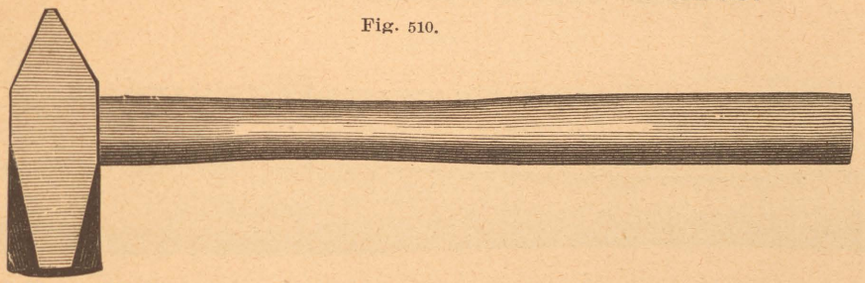
Fig. 509.



Per lb.,.....

BLACKSMITHS' HAND HAMMERS.

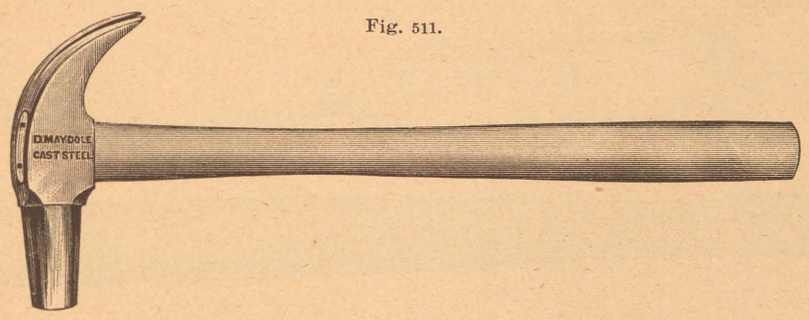
Fig. 510.



Yerkes & Plumb's No. 1, 2 lb. 6 oz., list, $12 00; No. 2, 3 lb., list, $13 50; No. 3, 3 lbs. 8 oz., list, $16 00 per doz.
Maydole's No. 62, 2 lbs. 10 oz., list, $11 00; No. 61, 3 lbs., list, $12 per doz.

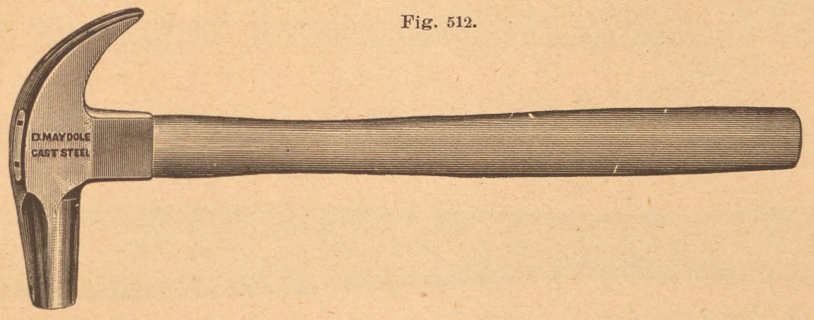
FARRIERS' HAMMERS.

Fig. 511.



Yerkes & Plumb's plain eye, solid cast steel, weighs 10 oz., list, per doz..... $4 50
Maydole's No. 55 " " " " " 7 " " " " " 3 50

Fig. 512.



Yerkes & Plumb's adze eye, solid cast steel, weighs 11 oz., list per doz., ... $6 50
Maydole's No. 52 " " " " 7 " " " " 5 00

Fig. 513.

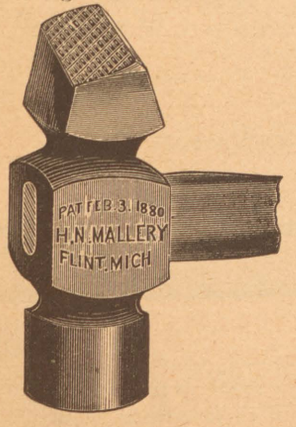
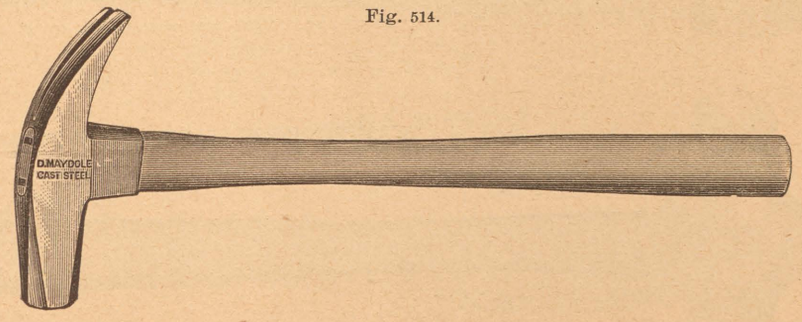


Fig. 514.



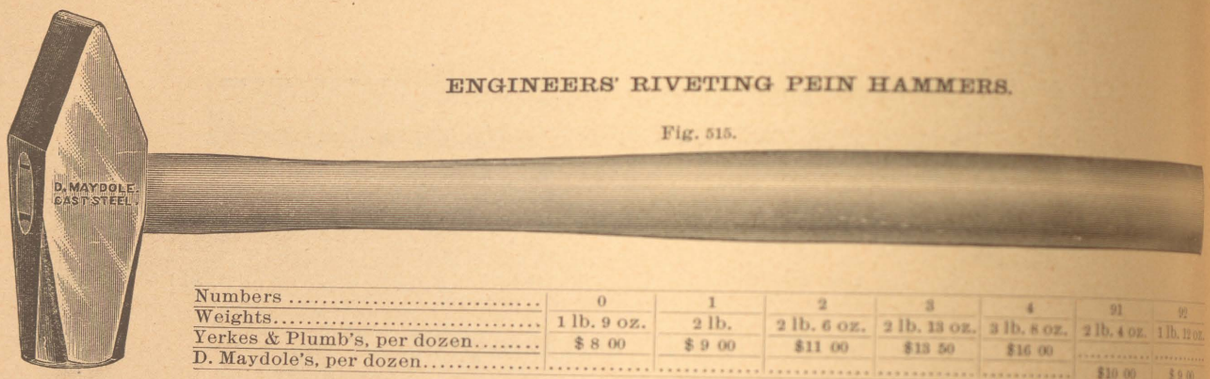
Yerkes & Plumb's Boston Pattern, solid cast steel, wt. 15 oz, list per doz. $9 50
Maydole's No. 51 " " " 10 " " 6 00

Horseshoe Fitting Hammer.—Price each, net $2 25

SOLID CAST STEEL HAMMERS.

ENGINEERS' RIVETING PEIN HAMMERS.

Fig. 515.



Numbers	0	1	2	3	4	91	92
Weights	1 lb. 9 oz.	2 lb.	2 lb. 6 oz.	2 lb. 13 oz.	3 lb. 8 oz.	2 lb. 4 oz.	1 lb. 12 oz.
Yerkes & Plumb's, per dozen	$ 8 00	$ 9 00	$11 00	$13 50	$16 00	.....	.....
D. Maydole's, per dozen	.....	.....	.....	.....	.....	$10 00	$9 00

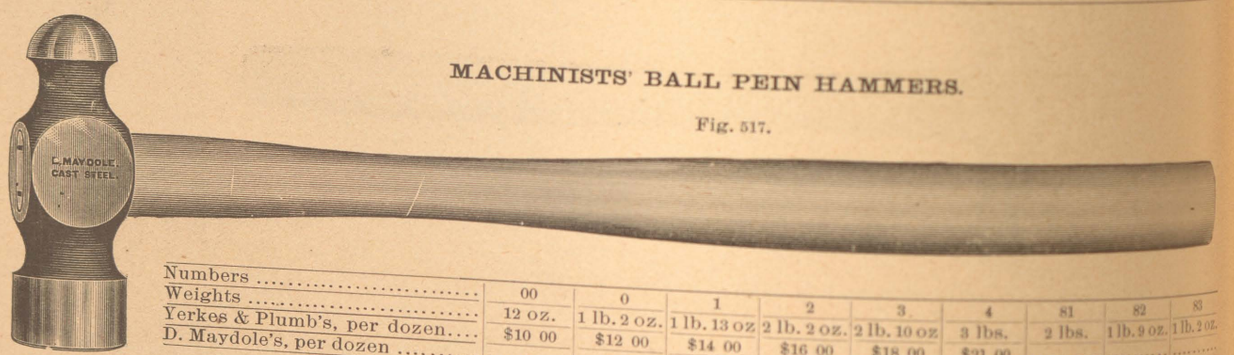
MACHINISTS' STRAIGHT AND CROSS PEIN HAMMERS.

Fig. 516.

Numbers	0	1	2	3	4	100	101	102	103
Weights	1 lb. 2 oz.	1 lb. 13 oz	2 lb. 2 oz.	2 lb. 10 oz	3 lb.	1 lb 12 oz.	1 lb. 6 oz.	1 lb. 2 oz.	12 oz.
Yerkes & Plumb's, per dozen	$12 00	$14 00	$16 00	$18 00	$21 00	.....	.....	.....	.....
D. Maydole's, per dozen	.....	.....	.....	.....	.....	$12 00	$11 00	$10 00	$9 00

MACHINISTS' BALL PEIN HAMMERS.

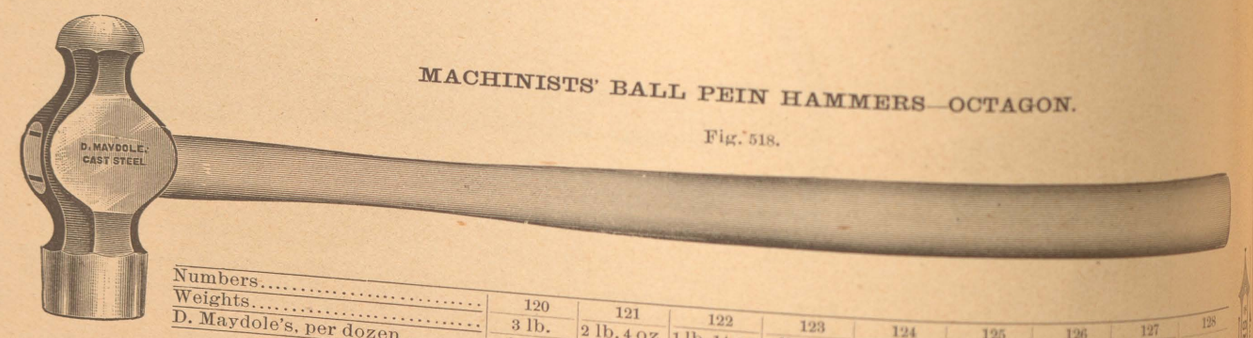
Fig. 517.



Numbers	00	0	1	2	3	4	81	82	83
Weights	12 oz.	1 lb. 2 oz.	1 lb. 13 oz	2 lb. 2 oz.	2 lb. 10 oz	3 lbs.	2 lbs.	1 lb. 9 oz.	1 lb. 2 oz.
Yerkes & Plumb's, per dozen	$10 00	$12 00	$14 00	$16 00	$18 00	$21 00	.....	.....	.....
D. Maydole's, per dozen	.....	.....	.....	.....	.....	.....	$12 00	$10 50	$9 00

MACHINISTS' BALL PEIN HAMMERS—OCTAGON.

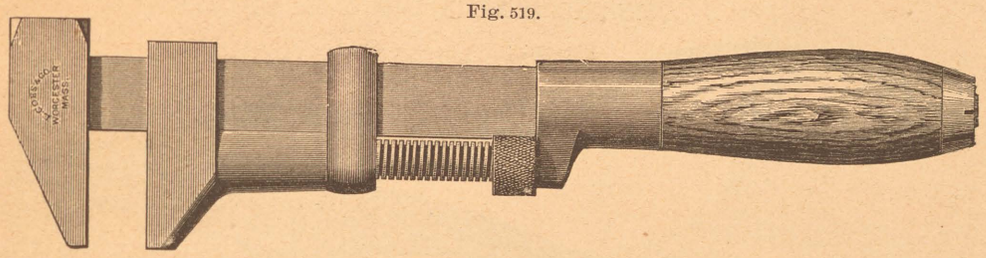
Fig. 518.



Numbers	120	121	122	123	124	125	126	127	128
Weights	3 lb.	2 lb. 4 oz	1 lb. 14 oz	1 lb 8 oz.	1 lb. 4 oz.	1 lb.	12 oz.	10 oz.	7 oz.
D. Maydole's, per dozen	$16 00	$14 00	$13 00	$12 00	$11 00	$10 00	$9 00	$8 00	$7 00

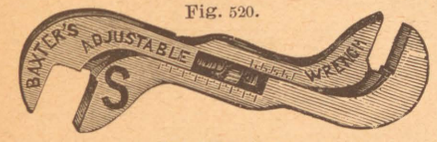
WRENCHES.

Fig. 519.



Length	6	8	10	12	15	18	21
Black	$ 9 00	10 00	12 00	14 00	24 00	30 00	36 00
Bright	10 00	11 00	14 00	16 00	26 00	32 00	38 00

Fig. 520.



"S" Wrench.

Fig. 521.

Diagonal Wrench.

Fig. 522.

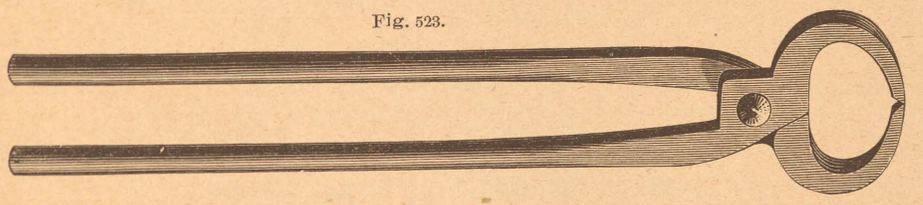
Alligator Wrench.

"S" or Diagonal,	4 inch	$ 6 00
"	6 "	9 00
"	8 "	12 00
"	10 "	18 00
"	12 "	24 00

	No.	Holds Pipe.	Holds round Iron.	Length.	Price.
Alligator	1	⅛ to ⅜	¼ to ¾	5¾	$ 4 00
	2	⅜ to ¾	½ to 1	10	12 00
	3	½ to 1¼	¾ to 1⅜	16	24 00
	4	1¼ to 2	1½ to 2½	22	36 00
	5	2 to 3	2¼ to 2½	27	54 00

HORSE SHOEING PINCERS.

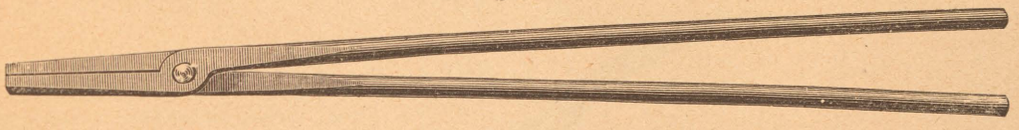
Fig. 523.



Wrought iron polished steel face, length, inches	10	12	14
Price, per doz	$ 20 50	22 50	25 50

BLACKSMITHS' TONGS.

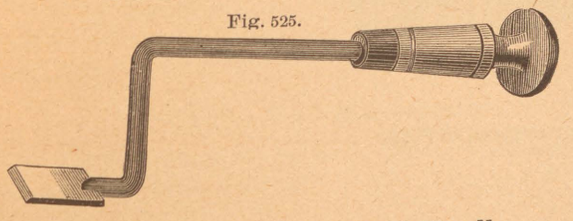
Fig. 524.



Length, inches	18	20	22	24	26	28	30
Price, per dozen	$ 6 00	6 80	7 60	8 40	9 20	10 00	10 80

BUTTRESSES.

Fig. 525.



Wrought Iron, Steel Blade, Wood Handle.

No. 1, Japanned, per doz ..... $ 20 00
No. 2, Polished, " 26 50

FARRIERS' KNIVES.

Fig. 526.

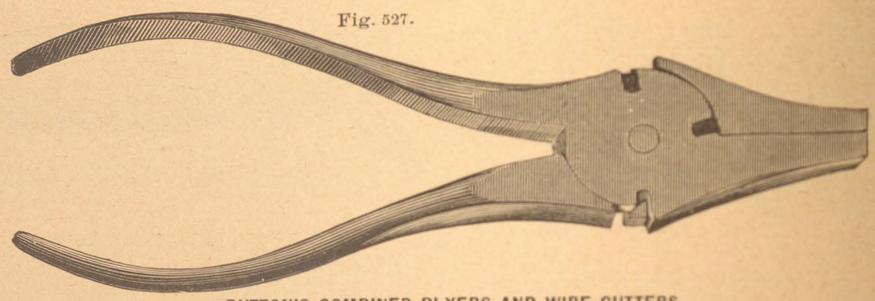
G. Wostenholm & Son's.

Price, per doz ..... $ 6 00

CUTTING NIPPERS AND PLYERS.

BUTTON'S COMBINED PLYERS AND WIRE CUTTERS.

Fig. 527.



BUTTON'S COMBINED PLYERS AND WIRE CUTTERS.

Length, inches,	4½	6	8	10
Price, per dozen,	$10 00	$12 00	$15 00	$24 00

CAST STEEL ROUND NOSE PLYERS.

Length, inches,	4	4½	5	5½	6	6½	7	8
Price, per dozen,	$2 50	$2 50	$2 75	$3 15	$3 55	$4 15	$4 75	$7 00

CAST STEEL FLAT NOSE PLYERS.

Length, inches,	4	4½	5	5½	6	6½	7	8
Price, per dozen,	$2 50	$2 50	$2 75	$3 15	$3 55	$4 15	$4 75	$7 00

CAST STEEL SIDE CUTTING PLYERS.

Length, inches,	5	5½	6	7	8
Price, per dozen,	$5 60	$6 25	$6 75	$8 50	$11 00

CAST STEEL END CUTTING NIPPERS.

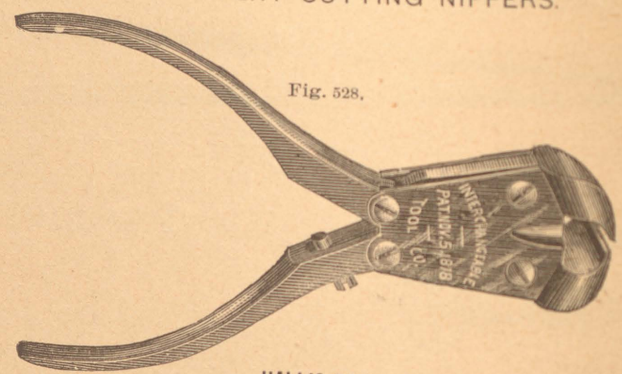
Length, inches,	4	4½	5	5½	6	6½	7	8
Price, per dozen,	$5 25	$5 25	$5 25	$5 75	$6 50	$7 50	$8 40	$11 00

TINNER'S IMPROVED CUTTING NIPPERS.

Number,	1	2	3	4	5
Length, inches,	12½	11	10	8½	7½
Price, each, (net),	$2 50	$2 25	$1 75	$1 50	$1 25

HALL'S PATENT CUTTING NIPPERS.

Fig. 528.



HALL'S PATENT CUTTING NIPPERS.

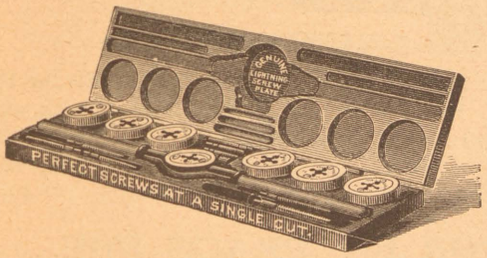
Length, inches,	5	7
Price of Nippers, per dozen,	$13 50	$21 00
Price of Extra Jaws, per pair,	.50	.75

LINDSAY'S PATENT GIANT CUTTING NIPPERS.

7 inches long, will cut wire up to $\frac{3}{16}$ inches. Price, per dozen, ... $21 00

LIGHTNING SCREW PLATES.

Fig. 529.



The Lightning Screw Plate in Case.

ASSORTMENT O, STOCK 6 INCHES LONG.

Taps, Dies, Tap Wrench, Stock, &c., with sizes:

$\frac{1}{8}$ $\frac{5}{32}$ $\frac{3}{16}$ $\frac{7}{32}$ $\frac{1}{4}$ in.

Price, in case $7 50
Holder for Bit Brace, if required 1 00

We supply with this stock 20 sizes under $\frac{9}{32}$, with various pitches of thread, and assortments wanted may be selected from table given.

ASSORTMENT A, STOCK 10 INCHES LONG.

Taper or Plug Taps, Dies, Guides, Stock, &c., of the following sizes:

$\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ in.

Price, complete, in case $10 00
To above may be added Die for $\frac{1}{8}$ in. pipe, extra 1 50

ASSORTMENT AA, STOCK 18 INCHES LONG.

Taper Taps, Dies, Holders, Stock, &c., of the following:

$\frac{3}{16}$ $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ in.

Price, in case $16 50

ASSORTMENT B, STOCK 23 INCHES LONG.

Taper Taps, Dies, Holders, Stock, &c., of the following:

$\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ in.

Price, in case $25 00

To above may be added $\frac{3}{16}$ inch, or any intermediate sizes, at list prices, see next page; also the Pipe Dies, $\frac{1}{8}$ to 1 inch as given in Assortment C, for Pipe, below.

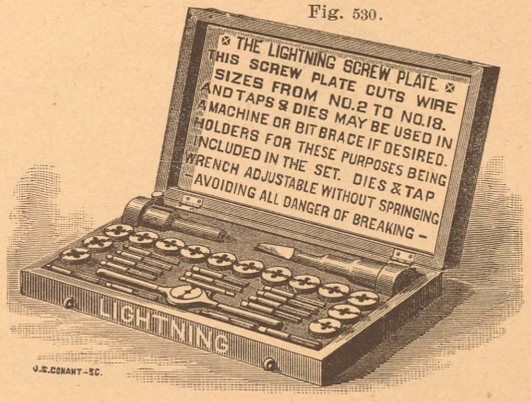
ASSORTMENT C, STOCK 26 INCHES LONG.

Taper Taps, Dies, Holders, Stock, &c., of the following:

$\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ 1 in.

Price, in case $32 75
To above may be added Taps, Dies, and Collets, $\frac{3}{16}$. 2 20
$\frac{1}{4}$, $2 20; $\frac{5}{16}$, $2 25, or any intermediate sizes, at list prices. see next page.

Fig. 530.



Full set of No. 0 with 14 sizes Taps and Dies, Tap Wrench, Bit Brace Holder, and holder for lathe use. Price $20.

ASSORTMENT C, FOR PIPE, STOCK 29 INCHES LONG.

Stock, Dies, and Guides for R. H. or L. H.:

$\frac{1}{8}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 in.

Price, in case $17 00

These pipe dies are a superior article, not solid, but in two pieces, and adjustable on the same principle as the bolt dies. For same stock we can also supply dies for bolts, all sizes, $\frac{3}{16}$ to 1 inch if required.

ASSORTMENT D, STOCK 53 INCHES LONG.

Taper Taps, Dies, Holders, Stock, &c., of following sizes:

$\frac{7}{8}$ 1 $1\frac{1}{8}$ $1\frac{1}{4}$ $1\frac{3}{8}$ $1\frac{1}{2}$ in.

Price, complete $60 00

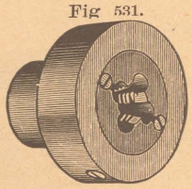
To above may be added any intermediate sizes at list prices.

Taps and Dies Furnished with No. o Lightning Screw Plates.

Diameter in parts of inch.	Screw Gauge Number.	No. of Threads to inch.			
$\frac{5}{64}$	2	60			
$\frac{3}{32}$	3	48	60		
$\frac{7}{64}$	4	40	44	48	
$\frac{1}{8}$	5	32	36	40	44
$\frac{9}{64}$	6	32	36	40	
$\frac{5}{32}$	8	32	36	40	
$\frac{11}{64}$	9	32	36	40	
$\frac{3}{16}$	10	24	28	32	
$\frac{13}{64}$	11	24	28	32	
$\frac{7}{32}$	12	22	24	28	32
$\frac{15}{64}$	13	22	24	28	32
$\frac{1}{4}$	14	18	20	24	32
$\frac{17}{64}$	16	18	20	24	32
$\frac{9}{32}$	18	18	20	24	

LIGHTNING SCREW PLATES AND TAPS.

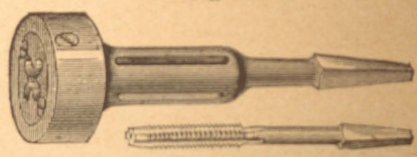
Fig. 531.



Machine Die in holder for use in lathe chucks or bolt cutters. Price..... $ 1 00

The machine dies differ from those used in the Lightning Plates only in being made to cut from face, instead of from under side.

Fig. 532.



The Bit Brace Holder takes any size of die, or the tap wrench. We also supply similar holders with one-half inch round shanks for use in lathes.

Price of either..... $1 00.

LIGHTNING TAPER REAMERS FOR BIT BRACE USE.

Fig. 533.

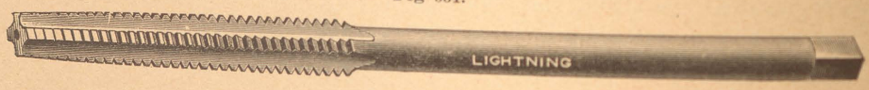
These Reamers are intended to make true, smooth holes when the punching or drilling is not quite perfect. We make them of the finest steel, in the most careful manner, and after hardening, grind them true the last thing. The quality and finish will be found very superior. The sizes are arranged to run into each other from the smallest to the largest, so that with a set of these useful tools any size from $\frac{3}{16}$ inch to $\frac{3}{4}$ inch may be accurately made. Each Reamer leaves a round, true cut hole.

They will also be found useful for work on hard wood as well as on iron.

PRICE LIST.

$\frac{1}{4}$ inch	$ 0 45	$\frac{9}{16}$ inch	$ 0 80
$\frac{5}{16}$ "	50	$\frac{5}{8}$ "	90
$\frac{3}{8}$ "	55	$\frac{11}{16}$ "	1 05
$\frac{7}{16}$ "	60	$\frac{3}{4}$ "	1 20
$\frac{1}{2}$ "	70	Full set of Reamers, 9 sizes, in case	7 25

Fig. 534.



PRICES OF TAPS AND DIES FOR LIGHTNING PLATES, &C.

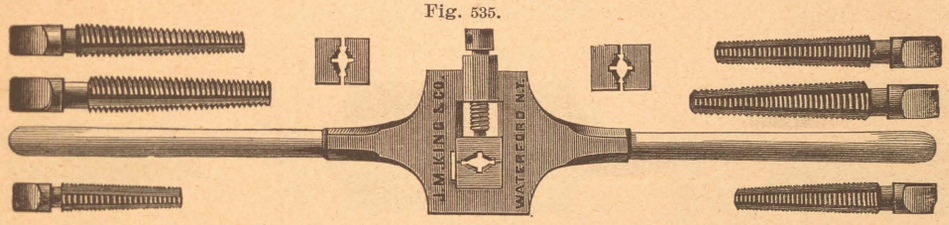
Sizes, Inches.	No. of Threads to Inch.		H'd Taps, each, Taper, Plug, or Botm'g.	Dies, each, without Collets.	Taps, Dies & Collets Sets, each, for Bolts.	Pipe Dies, each, with Guides.	Pipe Taps.
$\frac{3}{16}$	24		$ 0 45	$ 1 00	$ 2 20	.....	.....
$\frac{1}{4}$	18	20	45	1 00	2 20	$ 1 50	$ 1 25
$\frac{5}{16}$	16	18	50	1 00	2 25	.....	.....
$\frac{3}{8}$	14	16	55	1 15	2 45	1 90	1 50
$\frac{7}{16}$	12	14	60	1 30	2 65	.....	.....
$\frac{1}{2}$	12	13	70	1 50	2 95	2 35	1 87
$\frac{9}{16}$		12	80	1 75	3 30	.....	.....
$\frac{5}{8}$	10	11	90	1 90	3 55	.....	.....
$\frac{11}{16}$		11	1 05	2 10	3 90	.....	.....
$\frac{3}{4}$		10	1 20	2 35	4 30	3 75	2 50
$\frac{13}{16}$		10	1 40	2 60	4 75	.....	.....
$\frac{7}{8}$		9	1 60	3 00	5 35	.....	.....
$\frac{15}{16}$		9	1 80	3 40	5 95	.....	.....
1		8	2 00	3 75	6 50	5 00	3 12
$1\frac{1}{8}$		7	2 25	4 40	7 65	.....	.....
$1\frac{1}{4}$		7	2 60	5 00	8 60	5 50	3 75
$1\frac{3}{8}$		6	3 00	5 75	9 75	.....	.....
$1\frac{1}{2}$		6	3 50	7 00	11 50	5 50	4 62

Left-hand taps and dies same prices as right-hand.

Stocks for size 0, $1.00; A, $2.00; B and C—stock, $4.00; Collets, 75 cents each. Size D—Plate, $10; Collets, $1 each.

BLACKSMITH'S STOCKS AND DIES.

Fig. 535.



No. 1, Cuts 2 inch to 1 inch Right Hand, 4½ and 7 Threads to the inch; cuts 2 inch to 1 inch Left Hand, 4½ and 7 Threads to the inch; 8 Taps and 4 Pair of Dies, ... $60 00

No. 2, Cuts 2 inch to ⅞ inch Right Hand, 4½, 6, 7 and 8 Threads to the inch; 8 Taps and 4 Pair of Dies, ... 60 00

No. 3, Cuts 1¾ inch to ⅞ inch Right Hand, 6 and 8 Threads to the inch; cuts 1¾ inch to ⅞ inch Left Hand, 6 and 8 Threads to the inch; 8 Taps and 4 Pair of Dies, ... 45 00

No. 4, Cuts 1¾ inch to ¾ inch Right Hand, 6, 7, 8 and 9 Threads to the inch; 8 Taps and 4 Pair of Dies, ... 45 00

No. 5, Cuts 1½ inch to ¾ inch Right Hand, 8 and 9 Threads to the inch; cuts 1½ inch to ¾ inch Left Hand, 8 and 9 Threads to the inch; 8 Taps and 4 Pair of Dies, ... 35 00

No. 5½, Cuts 1½ inch to ¾ inch Right Hand, 6, 7, 8 and 9 Threads to the inch; 8 Taps and 4 Pair of Dies, ... 35 00

No. 7, Cuts 1¼ inch to ⅝ inch Right Hand, 8 and 10 Threads to the inch; cuts 1¼ inch to ⅞ inch Left Hand, 8 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 12 00

No. 9, Cuts 1¼ inch to ½ inch Right Hand, 8, 10 and 12 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 12 00

No. 17, Cuts 1 inch to ½ inch Right Hand, 9 and 12 Threads to the inch; cuts 1 inch to ¾ inch Left Hand, 9 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 9 00

No. 19, Cuts 1 inch to ⅜ inch Right Hand, 9, 12 and 14 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 9 00

No. 25, Cuts ¾ inch to ⅜ inch Right Hand, 10 and 12 Threads to the inch; cuts ¾ inch to ½ inch Left Hand, 10 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 6 50

No. 27, Cuts ¾ inch to ⅜ inch Right Hand, 10, 12 and 16 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 6 50

No. 45, Cuts ⅝ inch to $\frac{5}{16}$ inch Right Hand, 12 and 16 Threads to the inch; cuts ⅝ inch to $\frac{7}{16}$ inch Left Hand, 12 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 5 50

No. 47, Cuts ⅝ inch to ¼ inch Right Hand, 12, 14 and 18 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 5 50

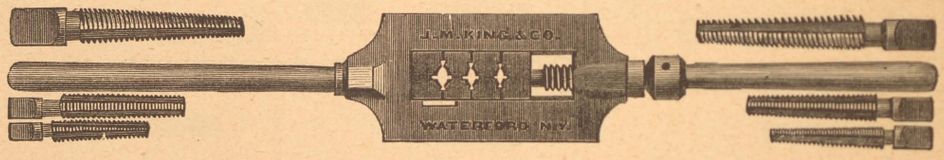
No. 49, Cuts ½ inch to ¼ inch Right Hand, 14 and 18 Threads to the inch; cuts ½ inch to $\frac{5}{16}$ Left Hand, 14 Threads to the inch; 6 Taps and 3 Pair of Dies, ... 4 50

No. 51, Cuts ½ inch to $\frac{3}{16}$ inch Right Hand, 14, 18 and 22 Threads to the inch; 6 Taps and 3 Pair of Dies, .. 4 50

We keep in stock of the above, Nos. 9, 17, 19, 27, 45, 47 and 51, but can furnish all other numbers at short notice.

BLACKSMITHS' STOCKS AND DIES. (Continued.)

Fig. 536.



No. 6, Cuts 1½ inch to 1 inch Right Hand, 8 Threads to the inch; cuts 1½ inch to 1 inch Left Hand, 8 Threads to the inch; 4 Taps and 2 Sets of Dies, ... $20 00

No. 11, Cuts 1¼ inch to ⅝ inch Right Hand, 8 and 10 Threads to the inch; cuts 1¼ inch to ⅞ inch Left Hand, 8 Threads to the inch; 4 Taps and 3 Sets of Dies, ... 10 00

No. 15, Cuts 1¼ inch to ½ inch Right Hand, 8, 10 and 12 Threads to the inch; 5 Taps and 3 Sets of Dies, ... 10 00

No. 21, Cuts 1 inch to ½ in Right Hand, 9 and 12 Threads to the inch; cuts 1 inch to ¾ inch Left Hand, 9 Threads to the inch; 4 Taps and 3 Sets of Dies, ... 6 00

No. 23, Cuts 1 inch to ⅜ inch Right Hand, 9, 10 and 14 Threads to the inch; 3 Taps and 3 Sets of Dies, ... 5 00

No. 32, Cuts ¾ inch to ⅜ inch Right Hand, 10 and 14 Threads to the inch; cuts ¾ inch to ⅜ inch Left Hand, 10 and 14 Threads to the inch; 4 Taps and 4 Sets of Dies, ... 5 00

No. 33, Cuts ¾ inch to ½ inch Right Hand, 10 Threads to the inch; cuts ¾ inch to ½ inch Left Hand, 10 Threads to the inch; 2 Taps and 2 Sets of Dies, ... 4 00

No. 34, Cuts ¾ inch to $\frac{5}{16}$ inch Right Hand, 10, 12 and 16 Threads to the inch; 3 Taps and 3 Sets of Dies, .. 4 50

No. 35, Cuts ¾ inch to ⅜ inch Right Hand, 10 and 14 Threads to the inch; 2 Taps and 2 Sets of Dies, ... 4 00

No. 37, Cuts ⅝ inch to $\frac{3}{16}$ inch Right Hand, 14, 18 and 22 Threads to the inch; 6 Taps and 3 Sets of Dies, .. 4 25

No. 38, Cuts ⅝ inch to $\frac{5}{16}$ inch Right Hand, 12 and 18 Threads to the inch; cuts ⅝ inch to $\frac{7}{16}$ Left Hand, 12 Threads to the inch; 6 Taps and 3 Sets of Dies, ... 4 50

No. 41, Cuts ½ inch to ⅛ inch Right Hand, 16, 20 and 26 Threads to the inch; 6 Taps and 3 Sets of Dies, ... 3 25

No. 42, Cuts ½ inch to $\frac{3}{16}$ inch Right Hand, 14 and 20 Threads to the inch; cuts ½ inch to $\frac{5}{16}$ inch Left Hand, 14 Threads to the inch; 6 Taps and 3 Sets of Dies, ... 3 50

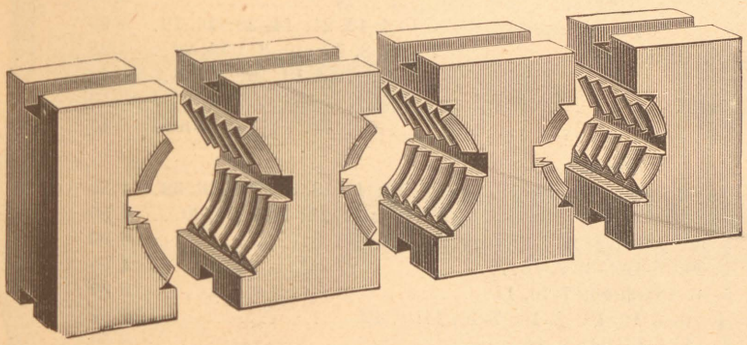
No. 53, Cuts $\frac{5}{16}$ to $\frac{1}{16}$ inch Right Hand, 16, 20, 24 and 32 Threads to the inch; 4 Taps and 4 Sets of Dies, .. 2 75

We keep in stock of the above, Nos. 15, 23, 34, 35, 37, 38, 41 and 53, but can furnish all other numbers at short notice.

BLACKSMITHS' DIES AND TAPS.

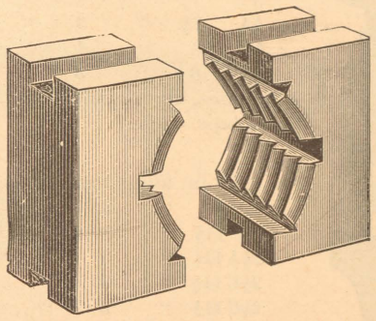
FURNISHED EXTRA.

Fig. 537.



Complete Set of Dies.

Fig. 538.



Pair of Dies.

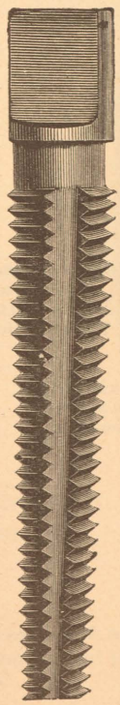
For No. 1 or 2 Stock	$ 12 00	For No. 25, 27 or 32 Stock	$ 2 25
" 3 or 4 "	10 00	" 33 "	1 50
" 5 or 5½ "	8 00	" 34 "	2 00
" 6 "	6 00	" 35, 37, 38, 41 or 42 Stock	1 50
" 7 or 9 "	3 50	" 45 or 47 Stock	2 25
" 11 or 15 "	3 00	" 49 or 51 "	2 00
" 17 or 19 "	2 50	" 53 "	1 50
" 21 or 23 "	2 00		

PLUG AND TAPER TAPS IN BOXES.

Fig. 539.

SIZE.	Hand	THREADS TO THE INCH.	Taps in ea. Box.	Price each Tap
1½ inch.	R	6 7 8	2	$ 3 00
1½ "	L	6 7 8	2	3 00
1¼ "	R	6 7 8 9	2	1 75
1¼ "	L	8 9	2	1 75
1 "	R	7 8 9 10	2	1 25
1 "	L	8 9	2	1 25
⅞ "	R	8 9 10	4	90
⅞ "	L	9	4	90
¾ "	R	7 8 9 10 12 14	6	65
¾ "	L	10 12	4	65
⅝ "	R	10 11 12 14 16	6	50
⅝ "	L	10 12	4	50
⅝ "	R	10 12 14 16	6	50
9/16 "	L	12	4	50
9/16 "	R	10 12 14 16 18	6	40
½ "	L	12 14	4	40
½ "	R	10 12 14 16 18	6	40
7/16 "	L	14	6	40
7/16 "	R	12 14 16 18 20	6	35
⅜ "	R	14 16 18 20 22	6	30
5/16 "	R	16 18 20 22 24 26	6	30
¼ "	R	24 26 28	6	30
3/16 "	R	30 32	6	30
⅛ "				

Fig. 580.



SCREW PLATES.

Fig. 541.

(Fig. 541).

No. 00.	6 in. long,	4 sets dies,	4 taps,	cutting 1-16, 64; 3–32, 56; 7-64, 48; $\frac{1}{8}$, 40			$2 50
00A.	6	"	3	"	4	"	" mach. screws, sizes 4, 36; 6 & 8, 32; 10, 24	2 50
0	7½	"	4	"	4	"	" 7-64, 48; $\frac{1}{8}$, 40; 3-16, 32; $\frac{1}{4}$, 24	3 00
0A	7½	"	3	"	4	"	" mach. screws, sizes 10 & 12, 24; 14, 20; 16, 18	3 25
1½	8	"	4	"	4	" fitting	" " " 6, 32; 8, 30; 10, 24; 14, 20	3 25
1½A	8	"	3	"	4	" "	" " " 14, 20; 16 & 18, 18; 20, 16	3 40
Extra dies, any required thread, per set								50
Extra taps, each								35, 40 and 45

Fig. 542.

(Fig. 542).

No. 1.	7 in. long,	3 sets dies,	6 taps	to fit mach. screws No. 4 & 6, 40; 4 & 6, 36; 8 & 10, 32			$4 50
2.	8	"	3	"	6	" " " No. 6 & 8, 32; 10 & 12, 24; 14 & 16, 20	4 50
2½.	11½	"	3	"	3	" ½, 12; ⅜, 16; ¼, 20	5 00
2½A	11½	"	3	"	3	" ¼, 20; 5-16, 18; ⅜, 16	4 80
2½B	11½	"	3	"	3	" 5-16, 18; ⅜, 16; 7-16, 14	5 00
2½C	11½	"	5	"	5	" ¼, 20; 5-16, 18; ⅜, 16; 7-16, 14; ½, 12	7 50
3	14	"	3	"	3	" ½, 12; 7-16, 14; ⅝, 16	5 50
3A	14	"	3	"	3	" ⅜, 16; ½, 12; ⅝, 11	5 80
3B	14	"	3	"	3	" 7-16, 14; ½, 12; ⅝, 11	5 90
3C	14	"	4	"	4	" ⅜, 16; 7-16, 14; ½, 12; ⅝, 11	7 15
3D	14	"	6	"	6	" ¼, 20; 5-16, 18; ⅜, 16; 7-16, 14; ½, 12; ⅝, 11	9 60
4A	19	"	3	"	3	" ½, 12; ⅝, 11; ¾, 10	6 90
7A	22	"	3	"	3	" ¾, 10; ⅞, 9; 1, 8	10 00
8A	26	"	4	"	4	" ¾, 10; ⅞, 9; 1, 8; 1¼, 7	13 60

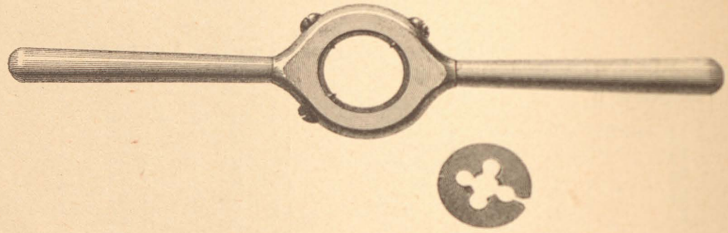
Extra dies for No. 1 plate, 50c.; No. 2, 50c.; No. 2½, 75c.; No. 3, 75c.; No. 4, $1.00; No. 7, $1.25; No. 8, $1.75.

Extra taps for No. 1, 35c.; No. 2, 35 and 40c.; Nos. 2½, 3, 4, 7 and 8, see page 163.

The above are machinists' plates. The taps furnished with the above plates are machinists' hand taper taps. We guarantee these plates to be first-class in every respect.

DIAMOND SCREW PLATES.

Fig. 543.



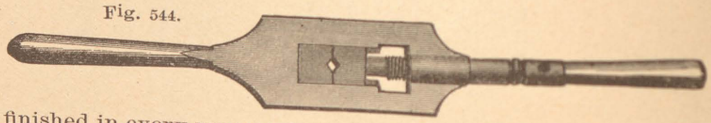
These plates are well made in every respect. The dies are made in one piece from the best tool steel, and are cut open on one side. The dies can be slightly opened or closed.

Dies and taps, cutting sizes of American Screw Company's machine screws.

Diamond A Plate,	6	dies and taps,	with tap wrench,	No. 4-36, 6-32, 8-32, 10-24, 12-24, 14-20			$6 50
" B "	5	"	"	"	"	No. 4-36, 6-32, 8-32, 10-24, 12-24	5 75
" C "	4	"	"	"	"	No. 6-32, 8-32, 10-24, 12-24	5 00
Price of stock only					$1 00	Price of taps, each, No. 4 to 12	35
Price of tap wrench					1 00	Price of taps, each, No. 14	40
Price of dies each					50		

TAP WRENCHES.

Fig. 544.



These wrenches are well finished in every respect, have steel dies, and are strong and durable.

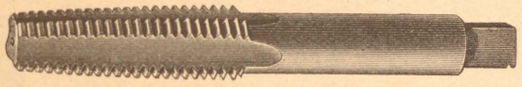
No. 0.	5½	inches long,	fitting taps	1-16 to ¼ inch	$1 00	No. 3. 14 in. long, fitting taps ½ to ⅞ inch	$3 00
No. 1.	8	"	"	⅛ to ⅜ inch	1 50	No. 4. 19 " " ¾ to 1¼ inch	4 00
No. 2.	12	"	"	¼ to ⅝ inch	2 00	No. 5. 24 " " ⅞ to 1½ inch	5 25

SETS OF MACHINISTS' HAND TAPS.

RELIEVED.—V AND FRANKLIN INSTITUTE SHAPE OF THREAD.

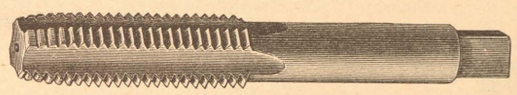
Unless advised to the contrary, we fill orders with the V Threads.

Fig. 545.



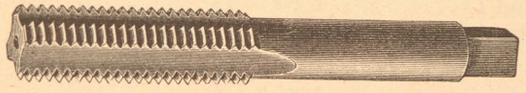
TAPER.

Fig. 545.



PLUG.

Fig. 546.



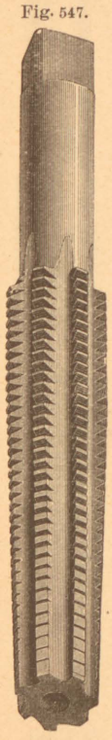
BOTTOMING.

Diameter.	*No. Threads to Inch.*	*Price Each.*	*Price Per Set.*
$\frac{1}{4}$	16, 18 and 20	$ 45	$ 1 35
$\frac{5}{16}$	16 and 18	50	1 50
$\frac{3}{8}$	14, 16 and 18	55	1 65
$\frac{7}{16}$	14 and 16	60	1 80
$\frac{1}{2}$	12, 13 and 14	70	2 10
$\frac{9}{16}$	12 and 14	80	2 40
$\frac{5}{8}$	10, 11 and 12	90	2 70
$\frac{11}{16}$	10, 11 and 12	1 05	3 15
$\frac{3}{4}$	10 and 12	1 20	3 60
$\frac{13}{16}$	10	1 40	4 20
$\frac{7}{8}$	9 and 10	1 60	4 80
$\frac{15}{16}$	9	1 80	5 40
1	8	2 00	6 00
$1\frac{1}{8}$	7 and 8	2 25	6 75
$1\frac{1}{4}$	7	2 60	7 80
$1\frac{3}{8}$	6	3 00	9 00
$1\frac{1}{2}$	6	3 50	10 50
$1\frac{5}{8}$	5 and $5\frac{1}{2}$	4 20	12 60
$1\frac{3}{4}$	5	5 00	15 00
$1\frac{7}{8}$	$4\frac{1}{2}$ and 5	5 80	17 40
2	$4\frac{1}{2}$	6 70	20 10

3 Taps to Set—Taper, Plug and Bottoming.

We keep in stock the above; also $\frac{1}{64}$ and $\frac{1}{32}$ over size up to $\frac{1}{2}$ and $\frac{1}{32}$ over size above $\frac{1}{2}$.

Fig. 547.



HUB TAPS FOR CUTTING DIES.

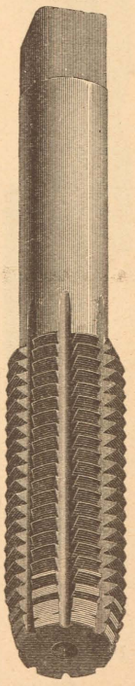
Fig. 547.

These are made to order at 25 per cent. advance on Nut Tap List.

All orders are filled with Hubs exact Diameter of order, with V Thread, unless otherwise ordered.

If wanted for cutting Screw Plate Dies, Taps are made considerably over size, but call the Hubs by the size of Bolt to be cut, and designate it as a Screw Plate Die Hub.

Fig. 548.



SHORT SHANK HUB TAP.

SHORT SHANK HUB TAP.

Fig. 548.

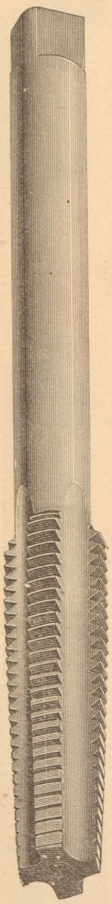
These we furnish at same price as Nut Tap.

MACHINE OR NUT TAPS.

V AND FRANKLIN INSTITUTE SHAPE OF THREAD. LONG SHANK—RELIEVED.

Unless advised to the contrary, we fill orders with V Threads.

Fig. 549.



Diam.	*No. Threads to Inch.*	*Price Each.*
1/4	16, 18 and 20	$0 60
5/16	16 and 18	70
3/8	14 and 16	80
7/16	12, 14 and 16	90
1/2	12, 13 and 14	1 00
9/16	12 and 14	1 15
5/8	10, 11 and 12	1 30
11/16	11 and 12	1 45
3/4	10	1 60
13/16	10	1 80
7/8	9 and 10	2 10

Diam.	*No. Threads to Inch.*	*Price Each.*
15/16	9	$2 40
1	8	2 80
1 1/8	7 and 8	3 20
1 1/4	7 and 8	3 70
1 3/8	6	4 20
1 1/2	6	4 70
1 5/8	5 and 5 1/2	5 30
1 3/4	5	6 00
1 7/8	4 1/2 and 5	6 80
2	4 1/2	7 70

Fig. 550.

PULLEY TAPS.

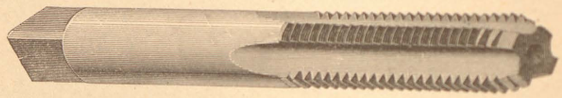
Fig. 550.

With V and U. S. S. Thread, of the following sizes, are kept in stock. Other sizes and threads are made to order and furnished at special prices.

Diam.	*Pitch.*	PRICES. 6 *in.*	8 *in.*	10 *in.*	12 *in.*	14 *in.*	16 *in.*	18 *in.*
3/8	14, 16,	80c.	$0 90	$1 10	....	....	....	....
7/16	14, 16,	90c.	1 00	1 20	....	....	....	....
1/2	12, 13,	....	....	1 40	$1 50	$1 60	....	....
5/8	10, 11,	...	....	1 50	1 60	1 75	$1 90	....
3/4	10,	....	....	....	1 80	2 10	2 30	$2 50

TAPS FOR MACHINE SCREWS.

Fig. 551.



Made of Stubs' Steel Wire, accurately cut, finely finished and well tempered. Less than six of one size will be charged as Single Taps.

Diameter.	*Wire Gauge Size.*	*No. Threads to Inch.*	PRICE *Each.*	*Per Dozen.*
7/64	No. 4	32, 36 and 40	.35	4 00
9/64	" 6	30, 32, 36 and 40	.35	4 00
1/8	" —	30, 32, 36 and 48	.35	4 00
5/32	" 8	30, 32 and 36	.35	4 00
3/16	" 10	20, 22, 24, 30 and 32	.35	4 00
7/32	" 12	20, 22 and 24	.35	4 00
1/4	" 14	16, 18, 20, 22 and 24	.38	4 40
17/64	" 16	16, 18, 20 and 22	.38	4 40
9/32	" 18	16, 18 and 20	.38	4 40
5/16	" 20	16, 18 and 20	.45	5 30
3/8	" 24	14, 16 and 18	.45	5 30

PATENT INCREASE TWIST DRILLS.

Fig. 552.

With No. 102 Morse, or No. 103 American Taper, or No. 104, Straight Shanks.

Socket for American Taper.	Diameter.	Length.	Price each.	Socket for Morse Taper.
No. 4, $2.50; No. 3, $2.00; No. 2, $1.55; No. 1, $1.30.	1/4	6 1/8	$ 0 60	No. 1, $1.20; No. 2, $1.80; No. 3, $2.50.
	9/32	6 1/4	65	
	5/16	6 3/8	70	
	11/32	6 1/2	75	
	3/8	6 5/8	80	
	13/32	7	85	
	7/16	7 1/4	90	
	15/32	7 1/2	95	
	1/2	7 5/8	1 00	
	17/32	8	1 10	
	9/16	8 1/4	1 20	
	19/32	8 1/2	1 30	
	5/8	8 3/4	1 40	
	21/32	9	1 50	
	11/16	9 1/4	1 60	
	23/32	9 1/2	1 70	
	3/4	9 3/4	1 85	
	25/32	9 7/8	2 00	
	13/16	10	2 15	
	27/32	10 1/4	2 30	
	7/8	10 1/2	2 45	
	29/32	10 3/4	2 60	
	15/16	10 3/4	2 75	
	31/32	10 7/8	2 90	
1		11	3 00	
1 1/32		11 1/8	3 20	
1 1/16		11 1/4	3 40	
1 3/32		11 1/2	3 60	
1 1/8		11 3/4	3 80	
1 5/32		11 7/8	4 00	
1 3/16		12	4 20	
1 7/32		12 1/8	4 40	
1 1/4		12 1/2	4 50	

Shanks of the Morse and American Taper Drills 1 7/32 to 2 in. diameter are the same size.	Diameter.	Length.	Price each.	Socket for Morse Taper.
	1 9/32	14 1/8	$ 4 65	No. 4, $4.00.
	1 5/16	14 1/4	4 80	
	1 11/32	14 3/8	5 00	
	1 3/8	14 1/2	5 20	
	1 13/32	14 5/8	5 40	
	1 7/16	14 3/4	5 60	
	1 15/32	14 7/8	5 80	
	1 1/2	15	6 00	
	1 17/32	15 1/8	6 30	
	1 9/16	15 1/4	6 60	
	1 19/32	15 3/8	6 90	
	1 5/8	15 1/2	7 20	
	1 21/32	15 5/8	7 50	
	1 11/16	15 3/4	7 80	
	1 23/32	15 7/8	8 10	
	1 3/4	16	8 40	
	1 25/32	16 1/8	8 60	
	1 13/16	16 1/4	8 80	
	1 27/32	16 3/8	9 00	
	1 7/8	16 1/2	9 20	
	1 29/32	16 1/2	9 35	
	1 15/16	16 1/2	9 50	
	1 31/32	16 1/2	9 65	
	2	16 1/2	9 80	
	2 1/32	16 1/2	10 20	No. 5, $7.50.
	2 1/16	17	10 60	
	2 1/8	17	11 20	
	2 3/16	17	12 00	
	2 1/4	17 1/2	12 80	
	2 5/16	17 1/2	13 60	
	2 3/8	18	14 40	
	2 7/16	18 1/2	15 00	
	2 1/2	19	15 60	

The above we furnish by 64ths if ordered.

Fig. 553.

STRAIGHT SHANK DRILLS.

JOBBERS' & MACHINISTS' SETS, NO. 105.			
Diameter.	Length.	Per Doz.	Each.
1–16	2 1/2	$ 1 00	$ 0 09
5–64	2 5/8	1 10	10
3–32	2 3/4	1 20	11
7–64	2 7/8	1 30	12
1/8	3	1 45	13
9–64	3 1/8	1 60	15
5–32	3 1/4	1 80	16
11–64	3 3/8	2 00	18
3–16	3 1/2	2 20	20
13–64	3 5/8	2 40	21
7–32	3 3/4	2 65	23
15–64	3 7/8	2 90	26
1/4	4	3 15	28
17–64	4 1/8	3 40	30
9–32	4 1/4	3 65	32
19–64	4 3/8	3 90	35
5–16	4 1/2	4 20	37
21–64	4 5/8	4 50	40
11–32	4 3/4	4 80	42
23–64	4 7/8	5 10	45
3/8	5	5 40	48
25–64	5 1/8	5 70	50
13–32	5 1/4	6 00	53
27–64	5 3/8	6 40	55
7–16	5 1/2	6 80	59
29–64	5 5/8	7 20	63
15–32	5 3/4	7 50	65
31–64	5 7/8	7 75	67
1/2	6	8 00	70

LETTER SIZES. NO. 106.			
Diameter.	Length.	Per Doz.	Each.
A	3 13/16	$ 2 90	$ 0 26
B	3 13/16	3 00	27
C	3 13/16	3 10	28
D	3 13/16	3 20	29
E	3 13/16	3 30	30
F	4 1/4	3 40	30
G	4 1/4	3 50	31
H	4 1/4	3 60	32
I	4 1/4	3 70	33
J	4 1/4	3 80	34
K	4 1/4	3 90	35
L	4 1/4	4 00	36
M	4 1/4	4 10	36
N	4 1/4	4 20	37
O	4 1/4	4 30	38
P	4 1/8	4 40	39
Q	4 3/4	4 60	40
R	4 3/4	4 80	42
S	4 7/8	5 00	44
T	4 7/8	5 20	45
U	5	5 40	47
V	5	5 60	49
W	5 1/8	5 80	51
X	5 1/4	6 00	53
Y	5 1/4	6 40	55
Z	5 3/8	6 80	59

For very exact work, a gauge plainly marked should accompany an order.

STRAIGHT SHANK MACHINE BITS FOR WOOD. No. 108.

Fig. 554.

Diameter.	Length.	Price Each.
1/8	3 inch	$ .20
5/32	3 1/4 "	.25
3/16	3 1/2 "	.30
7/32	3 3/4 "	.35
1/4	4 "	.40
9/32	4 1/4 "	.45
5/16	4 1/2 "	.50
11/32	4 3/4 "	.55
3/8	5 "	.65
10/32	5 1/4 inch	$ .70
7/16	5 1/2 "	.75
15/32	5 3/4 "	.80
1/2	6 "	.85
17/32	6 1/8 "	.95
9/16	6 1/4 "	1.00
5/8	6 1/2 "	1.15
11/16	7 "	1.35
3/4	7 1/2 "	1.65

Parties ordering Machine Bits will please state whether with Drill or Bit Point.

Price per Set, with Bit Point 1/8 inch to 1/2 inch mounted, varying by 32ds, $7.00.

BIT STOCK DRILLS FOR METAL OR WOOD. No. 109.

Fig. 555.

Diameter.	Price per Dozen.	Price Each.
2/32	$1.50	$ .14
3/32	1.65	.16
4/32	2.10	.20
5/32	2.60	.24
6/32	3.10	.29
7/32	3.60	.33
8/32	4.10	.38
9/32	4.70	.43
10/32	$ 5.40	$ .48
11/32	6.30	.54
12/32	7.20	.62
13/32	8.00	.68
14/32	8.80	.75
15/32	9.60	.82
16/32	10.30	.87
17/32	11.00	.92

Price per Set, 2/32 to 8/32 by 32ds, 10/32 to 12/32 by 16ths, boxed, $2.60.

Our Bit Stock Drills will fit any Brace in the market, and will drill steel, iron, or other metals, as well as wood. They are not injured by contact with screws or nails, and will bore any kind of wood without splitting it.

DRILLS FITTING COE'S BLACKSMITHS' DRILL PRESS. No. 110.

Fig. 556.

Diameter.	Length.	Price Each.
1/8	6 inch	$ .55
3/16	6 "	.60
1/4	6 "	.70
5/16	6 "	.75
3/8	6 "	.85
7/16	6 "	.90
1/2	6 "	.95
9/16	6 "	1.00
5/8	6 inch	$ 1.05
11/16	6 "	1.15
3/4	6 "	1.25
13/16	6 "	1.35
7/8	6 "	1.45
15/16	6 "	1.60
1	6 "	1.80
1 1/8	6 "	2.20

The above Drills have Shanks 2 1/4 inches long and about 4-1/64 inch diameter.

DRILLS FITTING SILVER & DEMING'S BLACKSMITHS' DRILL PRESS. No. 112.

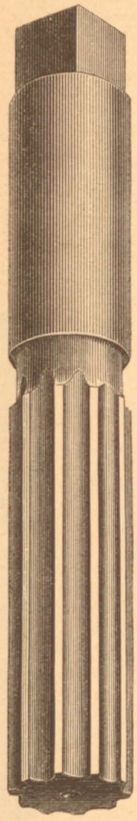
Nos. 1 and 2, with Shanks 1/2 inch diameter.

Size.	Length.	Price.
1/8	6 inch	$ .50
3/16	6 "	.55
1/4	6 "	.60
5/16	6 inch	$ .70
3/8	6 "	.75
7/16	6 "	.80
1/2	6 inch	$ .85
9/16	6 "	.90
5/8	6 "	1.05

Drills larger than 9-16 inch with Shanks 1/2 inch diameter, and Drills with Shanks about 41-64 inch diameter, fitting Silver & Deming's Press Nos. 3 and 4, same price as for Coe's Drill Press. All Drills are 6 inches entire length. Shanks 2 1/4 inches long.

SOLID REAMERS.

Fig. 557.



JOBBERS' SET. NO. 115.

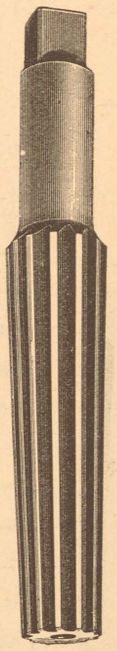
Diam.	Full lgth.	Lgth of Flute.	Price.
1/8	3	1 1/2	$ 1 00
5/32	3 1/4	1 5/8	1 10
3/16	3 1/2	1 3/4	1 20
7/32	3 3/4	1 7/8	1 30
1/4	4	2	1 40
5/16	4 1/2	2 1/4	1 50
3/8	5	2 1/2	1 60
7/16	5 1/2	2 3/4	1 75
1/2	6	3	1 90
9/16	6 1/2	3 1/4	2 00
5/8	7	3 1/2	2 20
11/16	7 1/16	3 1/16	2 40
3/4	8 3/8	4 3/16	2 60
13/16	9 1/16	4 1/2	2 80
7/8	9 1/16	4 13/16	3 10
15/16	10 1/4	5 1/8	3 40
1	10 7/8	5 7/16	3 70
1 1/16	11 1/4	5 5/8	4 00
1 1/8	11 5/8	5 13/16	4 30
1 3/16	12	6	4 60
1 1/4	12 1/4	6 1/8	4 90
1 5/16	12 7/16	6 3/16	5 20
1 3/8	12 5/8	6 5/16	5 60
1 7/16	12 13/16	6 3/8	6 00
1 1/2	13	6 1/2	6 40
1 9/16	13	6 1/2	6 80
1 5/8	13	6 1/2	7 20
1 11/16	13 1/2	6 3/4	7 60
1 3/4	13 1/2	6 3/4	8 00
1 13/16	13 1/2	6 3/4	8 40
1 7/8	14	7	8 80
1 15/16	14	7	9 20
2	14	7	9 60

SHORT SET. NO. 116.

Diam.	Full lgth.	Lgth of Flute.	Price.
1/4	3 3/4	2 3/16	$ 1 30
5-16	4	2 1/4	1 40
3/8	4 1/4	2 3/8	1 50
7-16	4 1/2	2 7/16	1 60
1/2	4 3/4	2 9/16	1 70
9-16	5	2 5/8	1 80
5/8	5 1/4	2 3/4	1 90
11-16	5 1/2	2 3/4	2 05
3/4	5 3/4	3	2 20
13-16	6	3 1/8	2 35
7/8	6 3/8	3 1/4	2 50
15-16	6 3/4	3 7/16	2 70
1	7 1/8	3 5/8	2 90
1 1-16	7 1/2	3 3/4	3 10
1 1/8	7 7/8	4	3 30
1 3-16	8 1/4	4 1/4	3 50
1 1/4	8 5/8	4 1/2	3 70
1 5-16	9	4 3/4	3 90
1 3/8	9 3/8	5	4 10
1 7-16	9 3/4	5 1/4	4 35
1 1/2	10	5 1/2	4 70
1 9-16	10 1/4	5 5/8	5 20
1 5/8	10 1/2	5 3/4	5 70
1 11-16	10 3/4	5 7/8	6 20
1 3/4	11	6	6 70
1 13-16	11 1/4	6 1/8	7 10
1 7/8	11 1/2	6 1/4	7 50
1 15-16	11 3/4	6 3/8	7 90
2	12	6 1/2	8 30

Reamers of any style, size, or length made to order. If for brass, please so advise.

Fig. 558.



PRICES OF SOLID REAMERS PER SET.

NO. 116.

Short Set 1/4 to 1 in. diameter	$ 25 50
" 1/4 to 1 1/4 "	39 00
" 1/4 to 1 1/2 "	56 00

Black Walnut cases for sets as above.

NO. 115.

Jobbers' Set, 1/4 to 1 in. diameter	$ 30 00
" 1/4 to 1 1/4 "	48 00
" 1/4 to 1 1/2 "	70 00

Prices each, net, $3.75, $4.25, and $4.50.

TAPER REAMERS.

NO. 118. Fig. 558.

For Reamer, Taper of Morse Drill Socket No. 1	$ 3 00
" " " " " " 2	3 50
" " " " " " 3	4 20
" " " " " " 4	5 00
" " " " " " 5	6 60

STUBBS' STEEL WIRE GAUGE.

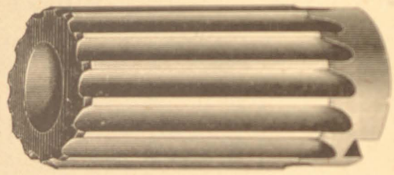
NO. 107.

Numbers by Gauge	1 to 5	Length	4	Price, per doz	$ 2 35
" "	6 to 10	"	3 11/16	" "	2 25
" "	11 to 15	"	3 1/2	" "	2 10
" "	16 to 20	"	3 1/4	" "	1 95
" "	21 to 25	"	3 1/16	" "	1 75
" "	26 to 30	"	2 13/16	" "	1 55
" "	31 to 35	"	2 5/8	" "	1 40
" "	36 to 40	"	2 7/16	" "	1 25
" "	41 to 45	"	2 1/4	" "	1 10
" "	46 to 60	"	2 1/16 to 1 3/4	" "	95
" "	61 to 70	"	1 1/2	" "	90
" "	71 to 80	"	1 5/16 to 3/4	" "	1 00

Price, each		$ 0 22
" "		21
" "		20
" "		19
" "		17
" "		15
" "		14
" "		12
" "		10
" "		09
" "		08
" "		09

SHELL REAMERS. No. 117.

Fig. 559.



Diameter.	Length.	Size Hole.	Price each.
¼ inch.	1½ inch.	⅛ inch.	$ 1 10
5–16 "	1½ "	⅛ "	1 10
⅜ "	1¾ "	3–16"	1 20
7–16 "	1¾ "	¼ "	1 30
½ "	2 "	¼ "	1 40
9–16 "	2 "	5–16"	1 50
⅝ "	2¼ "	⅜ "	1 60
11–16 "	2¼ "	⅜ "	1 60
¾ "	2½ "	½ "	1 60
13–16 "	2½ "	½ "	1 60
⅞ "	2½ "	½ "	1 70
15–16 "	2½ "	½ "	1 70
1 "	2¾ "	⅝ "	1 80
1 1–16 "	2¾ "	⅝ "	1 80
1⅛ "	2¾ "	⅝ "	1 90
1 3–16 "	2¾ "	⅝ "	2 60
1¼ "	2¾ "	⅝ "	2 20
1 5–16 "	3 "	¾ "	2 40
1⅜ "	3 "	¾ "	2 60
1 7–16 "	3 "	¾ "	2 80
1½ "	3 "	¾ "	3 00
1 9–16 "	3 "	¾ "	3 20
1⅝ "	3 "	¾ "	3 50
1 11–16 "	3½ "	1 "	3 80

Diameter.	Length.	Size Hole.	Price each.
1⅞ inch.	3½ inch.	1 inch.	$ 4 10
1 13–16 "	3½ "	1 "	4 40
1¼ "	3½ "	1 "	4 70
1 15–16 "	3½ "	1 "	5 00
2 "	3½ "	1 "	5 20
2 1–16 "	3¾ "	1¼ "	5 40
2⅛ "	3¾ "	1¼ "	5 60
2 3–16 "	3¾ "	1¼ "	5 80
2¼ "	3¾ "	1¼ "	6 00
2 5–16 "	3¾ "	1¼ "	6 20
2⅜ "	3¾ "	1¼ "	6 40
2 7–16 "	3¾ "	1¼ "	6 60
2½ "	3¾ "	1¼ "	6 80
2 9–16 "	4 "	1½ "	7 00
2⅝ "	4 "	1½ "	7 30
2 11–16 "	4 "	1½ "	7 60
2¾ "	4 "	1½ "	8 00
2 13–16 "	4 "	1½ "	8 40
2⅞ "	4 "	1½ "	8 80
2 15–16 "	4 "	1½ "	9 20
3 "	4 "	1½ "	9 60

Shell Reamers of any size or length made to order.

Fig. 559.

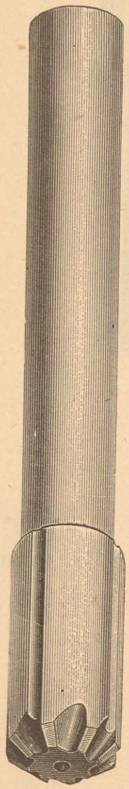


Fig. 561.

FLUTED CHUCKING REAMERS. No. 119. (Fig. 561.)

Diameter.	Fnll Length.	Length of Flute.	Price Each.
¼ less .005	6 inch.	⅞ inch.	$ 90
5-16 " .005	6 "	⅞ "	1 00
⅜ " .005	7 "	1 "	1 10
7-16 " .005	7 "	1 "	1 20
½ " .005	8 "	1⅛ "	1 30
9-16 " .005	8 "	1⅛ "	1 40
⅝ " .005	9 "	1¼ "	1 50
11-16 " .005	9 "	1¼ "	1 60
¾ " .005	9½ "	1⅜ "	1 70
13-16 " .005	9½ "	1⅜ "	1 85
⅞ " .005	10 "	1½ "	2 00
15-16 " .005	10 "	1½ "	2 15
1 " .005	10½ "	1⅝ "	2 30
1 1-16 " .005	10½ "	1⅝ "	2 45
1⅛ " .005	11 "	1¾ "	2 60
1 3-16 " .005	11 "	1¾ "	2 75
1¼ " .005	11½ "	1⅞ "	2 90

Diameter.	Full Length.	Length of Flute.	Price Each.
1 5-16 less .005	11½ inch.	1⅜ inch.	$ 3 05
1⅜ " .005	12 "	2 "	3 20
1 7-16 " .005	12 "	2 "	3 35
1½ " .005	12½ "	2⅛ "	3 50
1 9-16 " .005	12½ "	2⅛ "	3 65
1⅝ " .005	13 "	2¼ "	3 80
1 11-16 " .005	13 "	2¼ "	4 00
1¾ " .005	13½ "	2⅜ "	4 20
1 13-16 " .005	13½ "	2⅜ "	4 40
1⅞ " .005	14 "	2½ "	4 60
1 15-16 " .005	14 "	2½ "	4 80
2 " .005	14 "	2½ "	5 00

The above Reamers are finished 1-200 of an inch smaller than Whitworth's Standard Gauges.

ROSE CHUCKING REAMERS. No. 120. (Fig. 560.)

Diameter.	*Full Length.*	*Price Each.*
¼ inch	6 inch	$ 80
5-16 "	6 "	90
⅜ "	7 "	1 00
7-16 "	7 "	1 10
½ "	8 "	1 20
9-16 "	8 "	1 30
⅝ "	9 "	1 40
11-16 "	9 "	1 50
¾ "	9½ "	1 60
13-16 "	9½ "	1 70
⅞ "	10 "	1 80
15-16 "	10 "	1 95
1 "	10½ "	2 10
1 1-16 "	10½ "	2 25
1⅛ "	11 "	2 40

Diameter.	*Full Length.*	*Price Each.*
1 3-16 inch	11 inch	$ 2 55
1¼ "	11½ "	2 70
1 5-16 "	11½ "	2 85
1⅜ "	12 "	3 00
1 7-16 "	12 "	3 15
1½ "	12½ "	3 30
1 9-16 "	12½ "	3 45
1⅝ "	13 "	3 60
1 11-16 "	13 "	3 75
1¾ "	13½ "	3 90
1 13-16 "	13½ "	4 05
1⅞ "	14 "	4 20
1 15-16 "	14 "	4 40
2 "	14 "	4 60

TAP DRILLS.

We append the following table, showing the different sizes of Drills that should be used when a full Thread is to be tapped in hole. The sizes given are practically correct.

Diameter of Tap.	No. Threads to Inch.			Drill for V Thread.			Drill for U. S. S. Thread.			Drill for Whitworth Thread.		
1-4	16	18	20	5-32	5-32	11-64	....	....	3-16	....	....	3-16
9-32	16	18	20	3-16	13-64	13-64	....	....	....	....	....	....
5-16	16	18	..	7-32	15-64	....	....	1-4	....	....	15-64	....
11-32	16	18	..	1-4	17-64	....	....	....	....	....	....	....
3-8	14	16	18	1-4	9-32	9-32	....	9-32	....	....	9-32	....
13-32	14	16	18	19-64	21-64	21-64	....	....	....	....	....	....
7-16	14	16	..	21-64	11-32	....	11-32	....	....	11-32	....	....
15-32	14	16	..	23-64	3-8	....	....	....	....	....	....	....
1-2	12	13	14	3-8	25-64	25-64	....	13-32	....	3-8	....	....
17-32	12	13	14	13-32	27-64	27-64	....	....	....	....	....	....
9-16	12	14	..	7-16	29-64	....	7-16	....	....	....	....	....
19-32	12	14	..	15-32	31-64	....	....	....	....	....	....	....
5-8	10	11	12	15-32	1-2	1-2	....	1-2	....	....	1-2	....
21-32	10	11	12	1-2	17-32	17-32	....	....	....	....	....	....
11-16	11	12	..	9-16	9-16	....	....	....	....	....	....	....
23-32	11	12	..	19-32	19-32	....	....	....	....	....	....	....
3-4	10	11	12	19-32	5-8	5-8	5-8	....	....	5-8	....	....
25-32	10	11	12	5-8	21-32	21-32	....	....	....	....	....	....
13-16	10	..	..	21-32	....	....	....	....	....	....	....	....
27-32	10	..	..	11-16	....	....	....	....	....	....	....	....
7-8	9	10	..	45-64	23-32	....	23-32	....	....	23-32	....	....
29-32	9	10	..	47-64	3-4	....	....	....	....	....	....	....
15-16	9	..	..	49-64	....	....	....	....	....	....	....	....
31-32	9	..	..	51-64	....	....	....	....	....	....	....	....
1	8	..	..	13-16	....	....	27-32	....	....	27-32	....	....
1 1-32	8	..	..	53-64	....	....	....	....	....	....	....	....
1 1-16	8	..	..	55-64	....	....	....	....	....	....	....	....
1 3-32	8	..	..	57-64	....	....	....	....	....	....	....	....
1 1-8	7	8	..	29-32	15-16	....	15-16	....	....	15-16	....	....
1 5-32	7	8	..	15-16	31-32	....	....	....	....	....	....	....
1 3-16	7	8	..	31-32	1	....	....	....	....	....	....	....
1 7-32	7	8	..	1	1 1-32	....	....	....	....	....	....	....
1 1-4	7	..	..	1 1-32	....	..	1 1-16	....	....	1 1-16	....	....
1 9-32	7	..	..	1 1-16	....	....	....	....	....	....	....	....
1 5-16	7	..	..	1 3-32	....	....	....	....	....	....	....	....
1 11-32	7	..	..	1 1-8	....	....	....	....	....	....	....	....
1 3-8	6	..	..	1 1-8	....	....	1 5-32	....	....	1 5-32	....	....
1 13-32	6	..	..	1 5-32	....	....	....	....	....	....	....	....
1 7-16	6	..	..	1 5-32	....	....	....	....	....	....	....	....
1 15-32	6	..	..	1 3-16	....	....	....	....	....	....	....	....
1 1-2	6	..	..	1 15-64	....	....	1 9-32	....	....	1 9-32	....	....
1 17-32	6	..	..	1 9-32	....	....	....	....	....	....	....	....
1 9-16	6	..	..	1 9-32	....	....	....	....	....	....	....	....
1 19-32	6	..	..	1 5-16	....	....	....	....	....	....	....	....
1 5-8	5	5½	..	1 9-32	1 5-16	....	....	1 3-8	....	1 23-64	....	....
1 21-32	5	5½	..	1 5-16	1 11-32	....	....	....	....	....	....	....
1 11-16	5	5½	..	1 11-32	1 3-8	....	....	....	....	....	....	....
1 23-32	5	5½	..	1 3-8	1 13-32	....	1 1-2	....	....	1 1-2	....	....
1 3-4	5	..	..	1 13-32	....	....	....	....	....	....	....	....
1 25-32	5	..	..	1 7-16	....	....	....	....	....	....	....	....
1 13-16	5	..	..	1 15-32	....	....	....	....	....	....	....	....
1 27-32	5	..	..	1 1-2	....	....	....	1 5-8	....	1 37-64	....	....
1 7-8	4½	5	..	1 17-32	1 17-32	....	....	....	....	....	....	....
1 29-32	4½	5	..	1 9-16	1 9-16	....	....	....	....	....	....	....
1 15-16	4½	5	..	1 19-32	1 19-32	....	....	....	....	....	....	....
1 31-32	4½	5	..	1 5-8	1 5-8	....	....	....	....	....	....	....
2	4½	..	..	1 21-32	....	....	1 23-32	....	....	1 45-64	....	....

PRICES OF DRILLS PER SET.

No. 1, Set of Taper Shank Drills, $\frac{1}{4}$ to 1 inch, varying by 16ths,	$ 20 00
No. 2, Set of Taper Shank Drills, $\frac{3}{8}$ to 1¼ inch, varying by 16ths,	34 50
No. 3, Set of Taper Shank Drills, $\frac{3}{8}$ to $\frac{3}{4}$ inch by 32ds, $\frac{3}{4}$ to 1¼ inch by 16ths,	42 00
No. 4, Set of Taper Shank Drills, $\frac{3}{8}$ to $\frac{3}{4}$ inch by 32ds, $\frac{3}{4}$ to 2 inches by 16ths,	131 00
No. 5, Set Drills, Straight Shanks, $\frac{1}{16}$ to $\frac{1}{2}$ inch by 64ths, mounted,	10 00
No. 6, Set Drills, Straight Shanks, $\frac{1}{16}$ to $\frac{1}{2}$ inch by 32ds, mounted,	5 40
No. 7, Set Drills, from 60 to $\frac{3}{8}$ inch, mounted,	9 90
No. 8, Set Drills, Steel Wire Gauge, from No. 1 to 60, mounted,	8 10
No. 9, Half Set Drills, alternate Nos. from 1 to 59, mounted,	4 30
No. 10, Jewelers' Set of 36 Drills, No. 30 ($\frac{1}{8}$ in.) to No. 65, Steel Wire Gauge, mounted in Mahogany Case with Cap,	4 25
No. 11, Set of Taper Shank Drills, $\frac{3}{8}$ to 2 inches by 32ds,	240 00
No. 12, Set Machine Bits, $\frac{1}{8}$ inch to $\frac{1}{2}$ inch mounted, varying by 32ds,	7 00
No. 13, Set Bit Stock Drills, $\frac{1}{16}$ to $\frac{1}{4}$ by 32ds, $\frac{1}{4}$ to $\frac{3}{8}$ by 16ths, boxed,	2 60

HAND DRILLS.

Fig. 562.

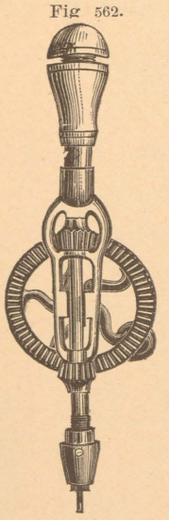
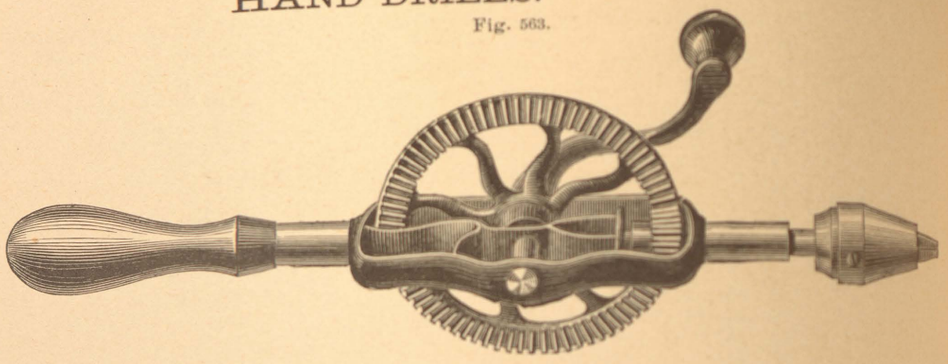


Fig. 563.



NO. 2.

The chuck of No. 2 Drill stock is the same style as the No. 1, but will hold $\frac{1}{4}$ inch drills and all smaller sizes. It has cut gears, is heavily nickel-plated, with rosewood head and handle. The head is hollow and contains six drill points. It is a tool much in demand.

Price, per dozen ..... $ 30 00

NO. 1.

No. 1, Single gear, hollow handle, nickel plated, per doz ..... $ 15 00
No. 1 B, double gear, same chuck, per doz 18 00

Six drill points with each of the above drill stocks.

These drill stocks are made of malleable iron, with steel spindle, and rosewood head and handle. The jaws are of forged steel, and will hold perfectly any size drill named above.

They are the only drill chucks in use which will hold Morse Twist Drills from $\frac{1}{32}$ to $\frac{1}{8}$ inch.

Breast Drill No. 10.

Fig. 564.

This drill is made of round wrought iron $\frac{5}{8}$ in. in diameter. The handles of rosewood, the head malleable iron, and the chuck jaws of steel. It has a changeable gear, one even and the other speeded. The change from one to the other can be made in one second. Will hold any shape shank—round, square, or flat.

This drill stock is heavily nickel plated and has cut gears.

Per doz $36 00

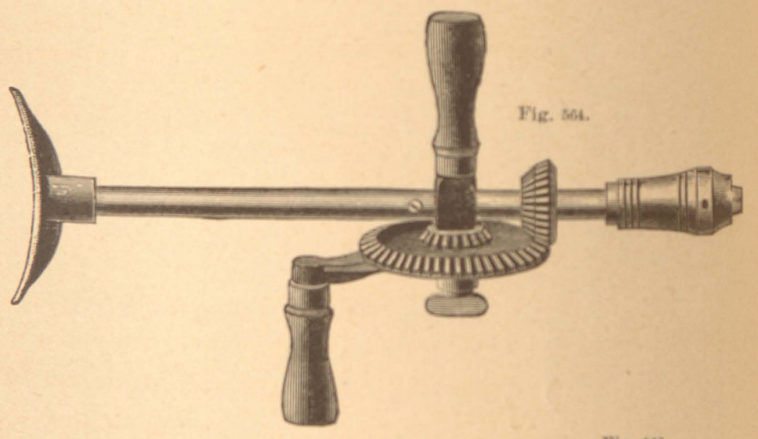
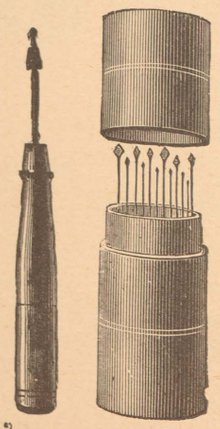


Fig. 564.

Fig. 565.



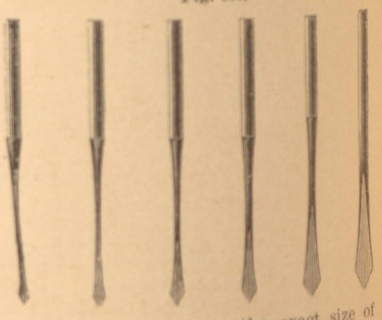
Graves' Automatic Drill and Drill Points.

This is a new invention, and is a most complete tool for bracket saw work. The stock is made of rosewood, with steel spindle.

The drill points are easily adjusted by means of a brass thimble, which screws on to the end of the spindle. It is easily worked with one hand, and will drill the most delicate wood without danger of splitting.

Price, with one dozen drill points, assorted, in rosewood box ..... $ 1 00
Per dozen 12 00

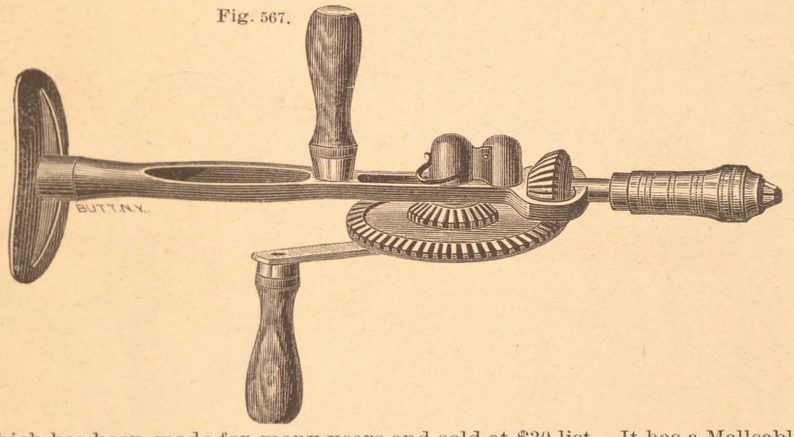
Fig. 566.



The cut represents the exact size of the drill points.
Price for set of six drills ..... 25 cents.

BREAST DRILL, NO. 12.

Fig. 567.

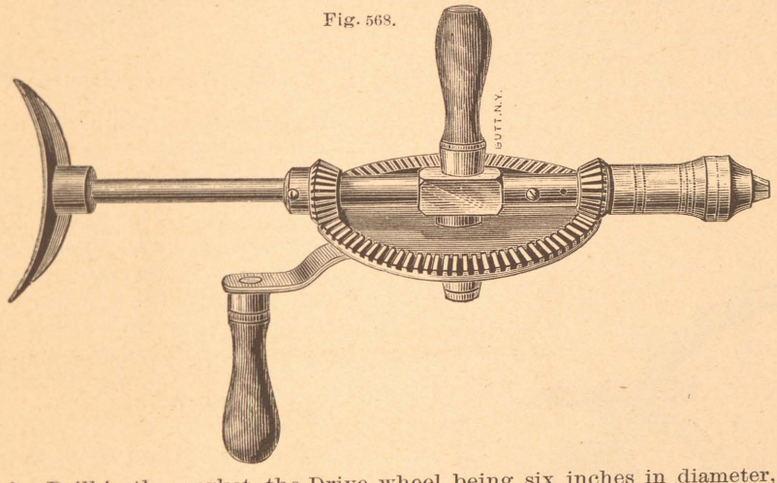


This is the Drill which has been made for many years and sold at $30 list. It has a Malleable Iron Stock, Japanned, Rosewood Handles, Polished and Plated Chuck, Changeable Gears, one even and the other 3 to 1. It has a Barber Improved Chuck with our recent improvement, which makes it hold perfectly, to olsof all sizes and shapes.

Price, per dozen, $30.00.

BREAST DRILL, NO. 13.

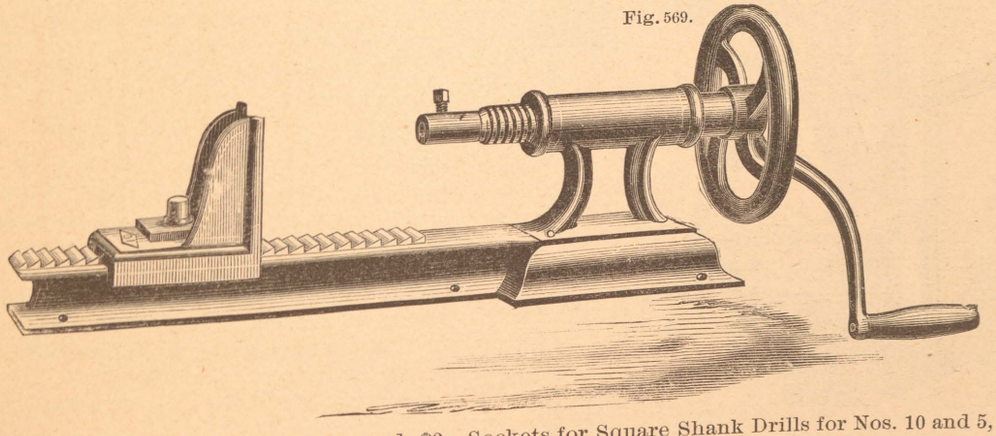
Fig. 568.



This is the largest size Drill in the market, the Drive-wheel being six inches in diameter, giving a speed of 4½ to 1 It is double-geared and most perfect in every part. It has Cut Gears, Steel Stock, Rosewood Handles, Steel Jawed Chuck which will hold any size square and round tool shanks. It is heavily Nickel Plated and really the best Breast Drill in the market. Price, per dozen, $48.00.

BLACKSMITHS' DRILL, NO. 10.

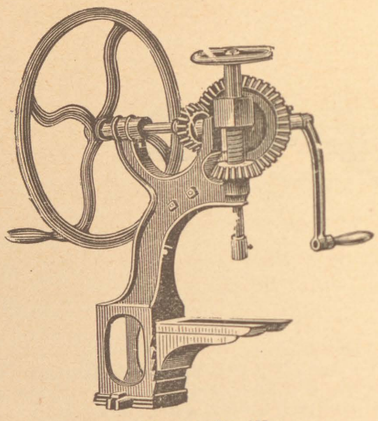
Fig. 569.



No. 10, Extra Heavy, $6; No. 5, Japanned, $3; Sockets for Square Shank Drills for Nos. 10 and 5, $1.

COE'S DRILLS.

Fig. 570.



No. 0 Bench Drill.

The No. 0 is suitable for carriage and blacksmith work and ordinary drilling. It is not a self-feeding machine.

Swings, 14 in.; wt. 80 lbs; price ..... $ 25 00
Vise, extra 2 50

Bench Drill.

This machine is single geared, compact in construction, and a desirable drill for light work in many branches of trade. Has a vertical motion of 2½ inches.

Swings, 10 in.; price ..... $ 12 00

Fig. 572.

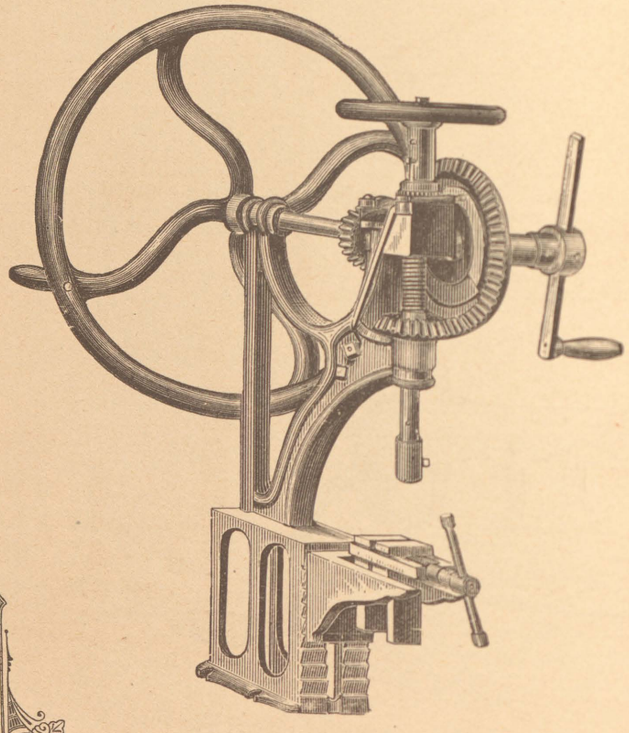
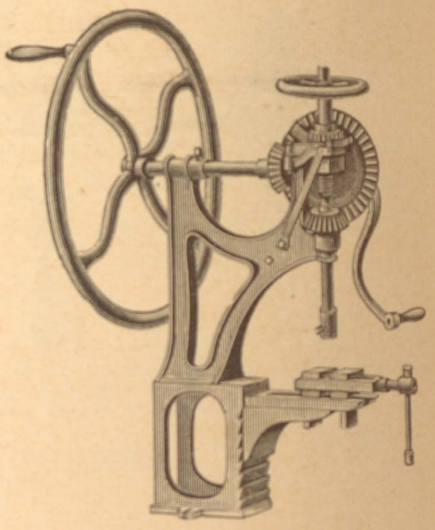


Fig. 571.



No. 1 Upright Double Geared Drill Press.

This machine is improved in design and has self-feed and vise, which are adjustable, and will work with or without them, as may be desired. This machine has no equal for carriage and blacksmith work. It will drill a hole one inch in diameter with perfect safety. It is so constructed that power and speed are combined in one machine. By using the side crank speed is obtained for drilling small holes. By using the fly wheel crank gives power, and one inch holes can be drilled with same strength as one-half inch holes can be drilled with side crank.

Weight, 125 lbs ; swings, 18 in.; price ..... $ 40 00
Less without vise 2 50

No. 2 Self Feed Drill, Press and Screw Cutter.

(Fig. 572).

For hand or power drilling. Has a vertical motion of four inches. Swings, 22 inches; weight over 200 lbs.

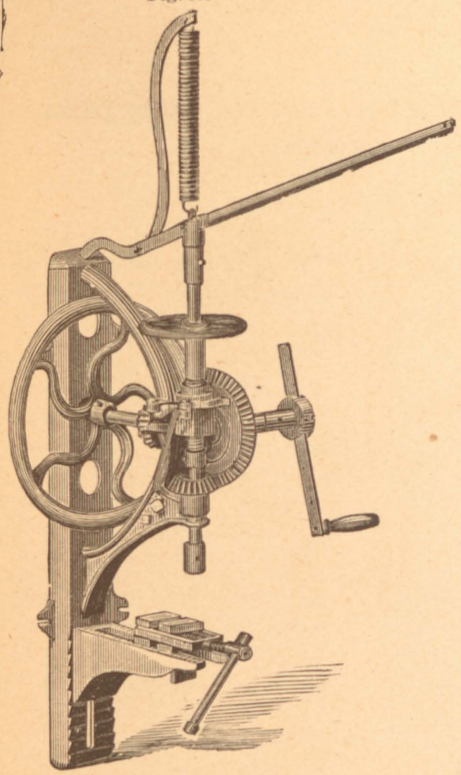
Price ..... $ 50 00
With cone pulleys, countershaft, hangers and shipper complete 80 00

The No. 2 Machine is capable of drilling a hole from ¼ to 1 inch in diameter. Both cranks can be used in drilling large holes.

Directions for Cutting Screws.—Turn from the balance wheel crank. Drill ¼ inch hole in center of vise jaws in which to insert the bolt to prevent its turning. Lower the chuck to the end of the rod by means of hand wheel on feed screw; then stop all feed and turn from crank on balance wheel. When the desired cut is reached raise the vise about one inch above the table and reverse the motion. By so doing the die is turned from the rod, and bolt and vise drop clear of the chuck.

For price list of twist drills see page 166.

Fig. 573

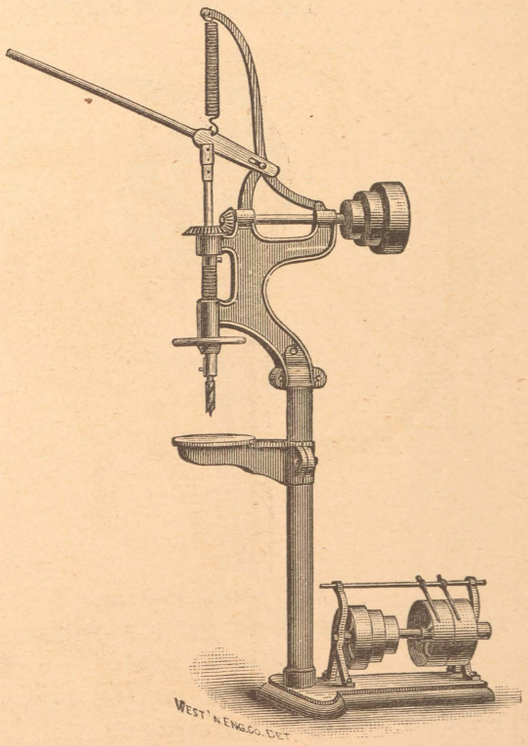


COE'S NO. 3 SELF FEED, POST DRILL PRESS AND WOOD BORER.

The feeding mechanism applies to a Drill like that patented January 20th, 1863. For drilling metal use screw feed, but for light drilling or boring in wood use the lever feed either by hand or foot, time being saved in raising the Drill, the action of the spring being instantaneous upon the pressure being released from the lever. When it is desired to bore or drill any particular depth the screw is so set as to control the play of the spindle by the end of the cap striking the hand feed wheel. In using the feed screw be sure to key the collar to the spindle, so that the end of the feed screw will press on it. In boring various materials, especially where they are homogeneous throughout, as is often the case in metals, it is found convenient that the workman should have direct control of the Drill, so that he may vary the pressure upon the same to prevent injury to the Drill. This can not be effected by the screw alone, but is readily attained by means of the lever, by which a variable pressure can be produced upon the Drill as required. The crank is adjustable. Vise attachment. Weight, 125 pounds. Swings, 22 inches.

Price, ... $45 00
Less without Vise, ... 2 50

Fig. 574.



COE'S POWER DRILL NO. 10.

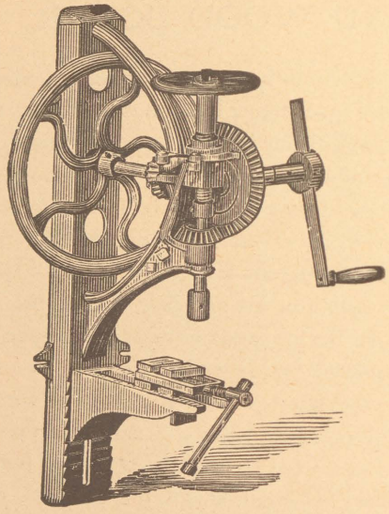
This Machine is made to work with screw and lever feed, as the different work requires, in order to meet the demand of carriage makers and blacksmiths for drilling wheels and work in general. It has wrought iron column 2½ inches in diameter; revolving table and face plate, with vertical movement of 28 inches. Spindle has vertical motion of 5 inches. Drive pulleys 9 inches in diameter, 2½ inch face, and should make 250 revolutions. Cone pulleys carry 2 inch belt. Swing, 18 inches. When the lever is used for drilling loosen the set screw in the collar on drill shaft. Weight, 350 pounds.

Price, ... $100.00

For Price List of Twist Drills see page 166.

COE'S DRILLS AND REPAIRS.

Fig. 575.



NO. 4 SELF FEED POST DRILL PRESS.

The most powerful Post Drill for its size in the market, adding to its other merits a larger sweep than any machine made. Swings 24 inches. Weight, 120 pounds.

Vertical Motion, 3 inch, Price.....$30 00
Vise, extra.....2 50

PRICE LIST OF REPAIRS FOR COE'S DRILL PRESSES.

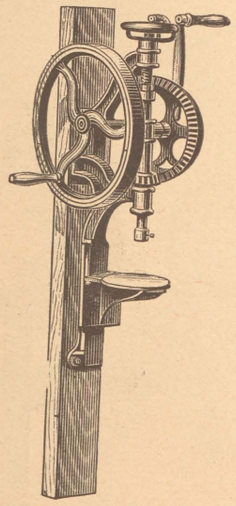
FITTED TO GO RIGHT TO PLACE.

	No. 0.	No. 1.	No. 2.
Fly Wheel,	$1 50	$2 00	$3 00
Frame,	10 00	12 00	19 00
Large Gear Wheel,	2 00	2 13	3 00
Small Gear Wheel,	1 00	1 22	1 76
Crank,	75	1 00	1 50
Arm,	1 00	1 26	2 75
Feed Screw,	5 00	7 40	10 75
Spindle,	2 00	3 00	4 00
Feed Joint,		1 00	1 25
Vise,		2 50	2 75
Vise Table,	75	1 00	1 50
Fly Wheel Shaft,	75	1 00	2 60
Crank,	75	1 25	1 90
Screw Hand Wheel,	75	1 00	2 00
Ratchet Wheel,		60	1 00
Spring,		34	56

Repairs for No. 4 same as those for No. 1.

THE SILVER & DEMING IMPROVED DRILLS.

Fig. 576.



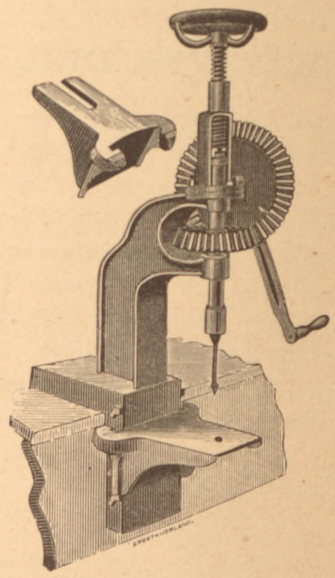
NO. 1. WITH SLIDING TABLE.

IMPROVED UPRIGHT SELF-FEEDING BLACKSMITH DRILL.

Will drill up to ¾ inch. Weight, 80 pounds.

Price, Fig. 576—No. 1. Improved Drill,.....$20 00

Fig. 577.



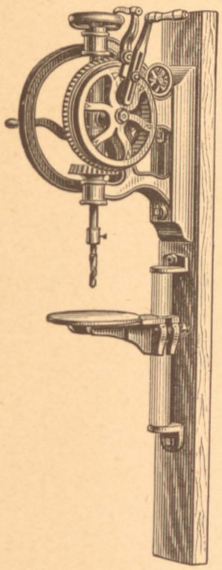
This Drill is single geared and without Self-Feed, but is strong and substantial, and will be found a very desirable machine for those wanting a cheap Drill.

Price, Upright Bench Drill,.....$12 00

For Price List of Twist Drills see Page 166.

SILVER & DEMING DRILLS.

Fig. 578.



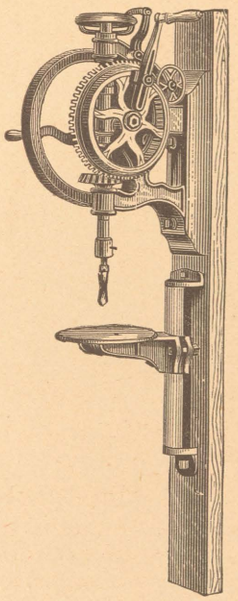
No. 2.—With Swinging Table.

Will drill up to 1 inch. Weight, 100 lbs.

PRICES.

Fig. 578—Improved drill, with sliding table....$ 25 00
Fig. 578— " " " swinging " 27 00

Fig. 579.



No. 3—With Swinging Table.

Will drill up to 1¼ inch. Weight, 160 lbs.

Fig. 579—Improved drill, with sliding table....$38 00
Fig. 579— " " " swinging " 40 00

Fitted with cone pulleys, countershaft, and cone belt, for power use, $10.00, extra list.

No. 4—With Swinging Table.

The No. 4 is the largest size drill we make. It is adapted to use in shops and factories where heavy work is done. When fitted for power, it will be found a very desirable drill for use in machine and repair shops. It is very strong and substantial, and all parts are fitted with accuracy.

Will drill up to 1½ inch. Weight, 225 lbs.

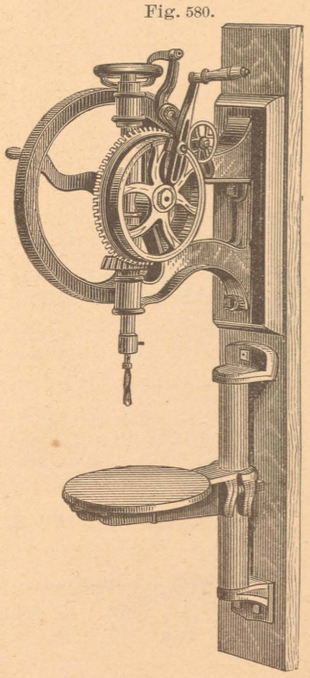
PRICES.

No. 4, Improved drill, with swinging table.....$ 60 00

Fitted with cone pulleys, countershaft, and cone belt, for power use, $10.00 extra list.

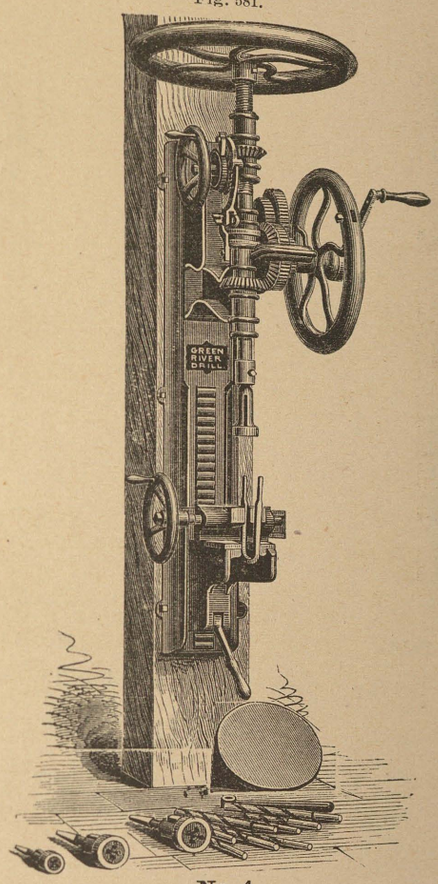
For price list of Twist Drills, see page 166.

Fig. 580.



GREEN RIVER DRILLING MACHINES.

Fig. 581.



No. 4.

WITH SCREW CUTTING ATTACHMENT.

No. 2 drills to $\frac{3}{4}$ in. Drill bits should have $\frac{1}{2}$ in. shank. Diameter balance wheel, $16\frac{1}{2}$ in. Drills to center of 15 in. circle. Weight 130 lbs. Price, complete ..... $ 28 00

Fitted with pulley for belt, if desired, $5.00 extra. Countershaft, $12.00 extra. Fine chuck, with strong steel jaws, fitted to machine when required, $10.00 extra. Vise, when required, with right and left screw, $10.00 extra.

No. 3 drills to 1 inch. Same style as No. 2, but larger. Drill bits should have $\frac{41}{64}$ in. shank. Diam. balance wheel, 20 in. Drill to center of 20 in. circle. Wt. 200 lbs. Price, complete ..... $ 47 00

Fitted with pulley for belt, if desired, $5.00 extra. Countershaft, $12.00 extra. Chuck, if required, $10.00 extra. Vise when required, with right and left screw, $10.00 extra.

No. 4 drills to $1\frac{1}{2}$ in. hole. Diam. of bal. wheel, 20 in. Wt., 250 lbs. Drills to cent. of 20 in. circle; price $ 70 00

The No. 4 is speeded for small work when crank is applied, as shown in the cut. For heavy work and for screw cutting, the crank is placed in the wheel at side of machine, which multiplies the power nearly three times.

Screw-cutting attachment with taps and dies $\frac{1}{4}$, 5-16, $\frac{3}{8}$, 7-16, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, vise and tap chuck, complete, extra, $40. Fitted with pulley for power, $7.50 extra. Countershaft, $12 extra.

TWIST DRILLS (For use in Green River Machines).

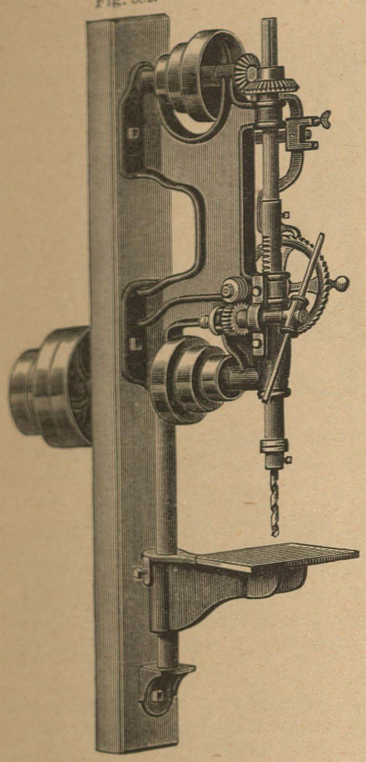
With shanks, $\frac{1}{2}$ in. diam: $\frac{1}{8}$, 45c; $\frac{3}{16}$, 55c; $\frac{1}{4}$, 65c; $\frac{5}{16}$, 75c; $\frac{3}{8}$, 85c; $\frac{7}{16}$, 95c; $\frac{1}{2}$, 1.10; $\frac{9}{16}$, 1.30; $\frac{5}{8}$, 1.50; $\frac{3}{4}$, 2; $\frac{7}{8}$, 2.60

do. $\frac{41}{64}$ in. diam: $\frac{1}{8}$, 58c; $\frac{3}{16}$, 65c; $\frac{1}{4}$, 73c; $\frac{5}{16}$, 80c; $\frac{3}{8}$, 88c; $\frac{7}{16}$, 93c; $\frac{1}{2}$, 98c; $\frac{9}{16}$, $1.03; $\frac{5}{8}$, 1.10; $\frac{3}{4}$, 1.80; $\frac{7}{8}$, 1.55; 1, 1.90; $1\frac{1}{8}$, 2.30; $1\frac{1}{4}$, 2.55; $1\frac{3}{8}$, 2.90; $1\frac{1}{2}$, 3.25.

The above supplied $\frac{1}{32}$ over exact size, unless otherwise ordered.

TAFT'S DRILLS.

Fig. 582.

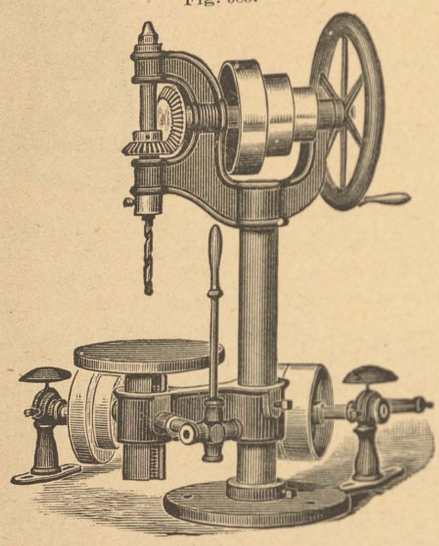


LITTLE GIANT, NO. 3.

Will drill 1¼ in. hole; wt. 150 lbs; price.....$75 00

Hand and power, with quick return arrangement if desired, self-feeding, with a 2-in. flat belt, three shifts cone, giving a very quick or slow motion to drill spindle.

Fig. 583.



NO. 10, BENCH DRILLING MACHINE.

Wt. 115 lbs; price net, with countershaft.....$50 00

For Hand or Power.

PRICE LIST OF TWIST DRILLS.

Made to fit Taft's Press.

LONG.

Size	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1	1 1/8
Price	.55	.60	.70	.75	.85	.90	.95	1 00	1 05	1 15	1 25	1 35	1 45	1 60	1 80	2 20

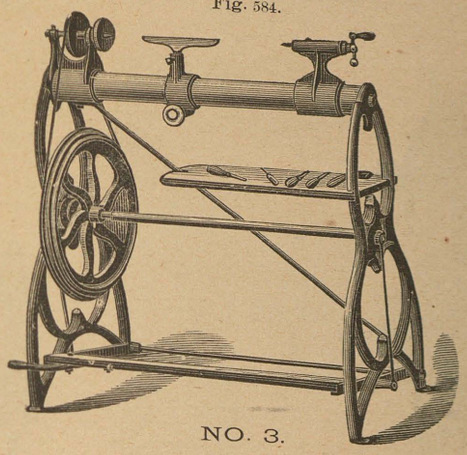
SHORT.

Size	1/8	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	13/32	7/16	15/32	1/2	17/32	9/16
Price	.45	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1 00	1 10	1 20
Size	19/32	5/8	21/32	11/16	23/32	3/4	25/32	13/16	27/32	7/8	29/32	15/16	31/32	1	1 1/16
Price	1 30	1 40	1 50	1 60	1 70	1 85	2 00	2 15	2 30	2 45	2 60	2 75	2 90	3 00	3 40

The above drills have shanks ½ or ⅝ inch in diameter.

MARSH'S CYLINDER BED LATHE.

Fig. 584.



NO. 3.

The above cut represents our new Foot Lathe, the novelty of which is chiefly in the cylinder bed; and the advantages of which are as apparent as its novelty. It is three feet long, turned perfectly straight and true. The head stock, tail stock and tool stock are all bored to fit nicely.

The head stock is fastened permanently with a set screw. The tail stock traverses the whole length of the bed, and is kept in line with front center at all times by a guide groove in the bed, and is readily fastened at any point by its clamping power, simply by turning a hand screw, which is on the back side of the Lathe and not shown in cut. The tool stock also encircles the bed, moves back and forth readily, and rocks to and from the work. It is sawed open on the bottom and provided with a set screw, which gives it a clamping power sufficient to hold it in position at any point by a single turn of the hand. It has a steel mandrel and two steel center points, all of which are turned up with care and precision.

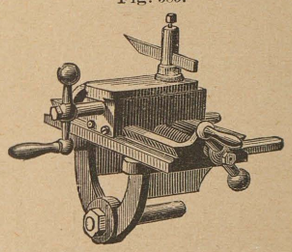
It has a brass box in front journal, and true bored iron bearings throughout. The face-plate screws on to the mandrel, is turned up true and polished. It has a three-cone grooved pulley turned up true and polished. The balance wheel is turned true and grooved to correspond with cone pulley. It is weighted to counterbalance the treadle. The crank shaft runs the whole length of the Lathe and has a crank on each end, thus avoiding any unequal strain upon the frame, and securing steadiness. It treads easily, and runs lightly and freely, at high speed.

The frame is stiff, but light and graceful. The entire structure is ingenious, mechanical, and elegant in appearance. Each machine is provided with one tool shelf, one face-plate, two steel centers, two T rests, and one round belt. Weight, about 175 pounds.

No person desiring a Foot Power Lathe, after trying one of the cylinder beds, would ever exchange for one of the old style flat way and toggle fastenings, and no purchaser of one of these Lathes would be willing to do long without its various attachments, which add so much to the entertainment of the possessor, and to the completeness and usefulness of the machine. Price, $30.

COMPOUND HAND SCREW-FEED METAL TURNING ATTACHMENT.

Fig. 585.

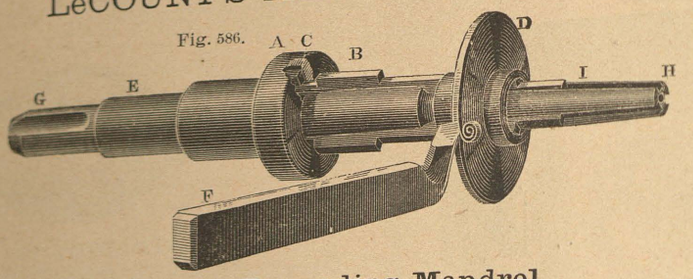


The above cut represents a Compound Hand Screw-Feed Tool Holder, for brass or other metal work, adapted to the Marsh Cylinder Bed Foot Lathe. It is a very complete and useful attachment for the above purpose, and makes the Cylinder Bed Lathe as complete for metal work as for wood work. They are made in the best mechanical style, with steel screws and dovetail slides, and are well finished. They have a movement of 6½ inches and weigh 12 pounds. They are kept constantly on hand, and furnished on short notice.

Price of above is $10. They are also made on a flat bed or base, in different sizes, adapted to other Lathes. Prices for other sizes given on application.

LeCOUNT'S MACHINISTS' TOOLS.

Fig. 586.



New Expanding Mandrel.

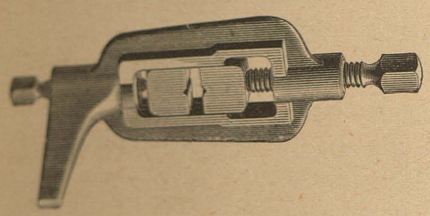
Amateur's size. Taking anything from $\frac{3}{8}$ to 1 in. inclusive. Price $5 00

MACHINISTS' SIZE.

No. 1.—Taking anything from $\frac{1}{2}$ to 1 inch $10 00
No. 2.— " " 1 to $1\frac{1}{2}$ inch 14 00
No. 3.— " " $1\frac{1}{2}$ to 2 inch 18 00
No. 4.—With screw, taking from 2 to 3 inch $32 00
No. 5. " " " " 3 to 4 inch 44 00

DIRECTIONS.—To tighten the work drive with a copper hammer, or a piece of soft iron or brass, on the large end G (not too hard) to loosen on small end H. You can take a good cut by driving with a one ounce copper or brass hammer, and not drive hard.

Fig. 587.

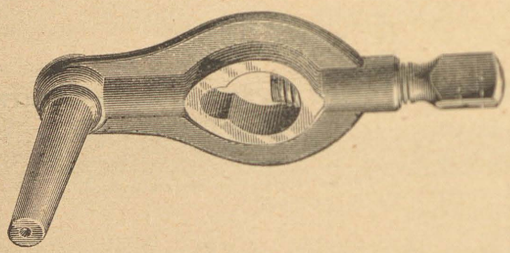


Die Dogs

Have a steel frame, with hardened steel screws. Extra dies can easily be fitted to suit any special work.

No. 1, opens $\frac{1}{2}$ inch $1 25
No. 2, " $\frac{3}{4}$ inch 1 60
No. 3, " 1 inch 2 00
No. 0, " $\frac{3}{8}$ inch, amateur's or foot lathe 1 25

Fig. 588.

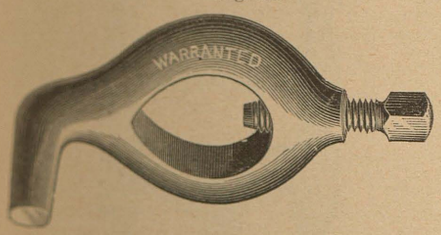


Amateur's Dog.

For small lathes, jewelers, amateurs, &c. It is steel, with hardened screws.

No. 1, $\frac{3}{8}$ inch bore $0 30
No. 2, $\frac{1}{2}$ " 35
No. 3, $\frac{3}{4}$ " 45
No. 4, 1 " 50
Full set 1 60

Fig. 589.



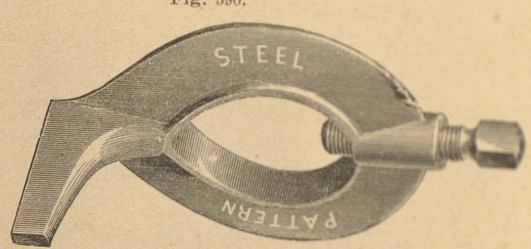
Heavy Steel Dog.

With steel screws. Lathe made and hardened.

No. 1, $\frac{3}{8}$ inch $0 50
" 2, $\frac{1}{2}$ " 60
" 3, $\frac{3}{4}$ " 70
" 4, $\frac{7}{8}$ " 70
" 5, 1 " 80
" 6, $1\frac{1}{8}$ " 80
" 7, $1\frac{1}{4}$ " 95
" 8, $1\frac{1}{2}$ " 95
" 9, $1\frac{3}{4}$ " 1 10
" 10, $1\frac{7}{8}$ " 1 10
No. 11, $1\frac{3}{4}$ inch $1 25
" 12, 2 " 1 40
" 13, $2\frac{1}{4}$ " 1 60
" 14, $2\frac{1}{2}$ " 1 60
" 15, 3 " 1 80
" 16, $3\frac{1}{2}$ " 2 00
" 17, 4 " 2 30
" 18, $4\frac{1}{2}$ " 3 00
" 19, 5 " 3 50

Full set, 19 dogs, $26.35.

Fig. 590.



Light Steel Dog.

No. 1, $\frac{3}{8}$ inch $0 40
2, $\frac{1}{2}$ " 50
3, $\frac{3}{4}$ " 60
4, 1 " 70
5, $1\frac{1}{4}$ " 85
6, $1\frac{1}{2}$ " 95
7, $1\frac{3}{4}$ " 1 10
8, 2 " 1 20

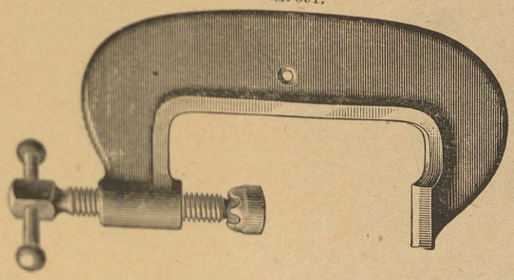
Small set, $6.30.

No. 9, $2\frac{1}{2}$ inch 1 40
10, 3 " 1 60
11, $3\frac{1}{2}$ " 1 80
12, 4 " 2 00

Full set, $13.00.

LE COUNT'S MACHINISTS' TOOLS.

Fig. 591.



LECOUNT'S STEEL CLAMP.

Extra Heavy, with Button on end of Screw, hung on a ball so as to accommodate itself to irregularities without bending the Screw. The foot of the Clamp is planed.

No. 1,	Opening to 2	inch,	$1 75
No. 2,	" 3	"	2 00
No. 3,	" 4	"	2 25
No. 4,	" 5	"	2 50
No. 5,	" 6	"	2 75
No. 6,	" 8	"	3 25
No. 7,	" 10	"	3 75
No. 8,	" 12	"	4 25

MALLEABLE IRON LATHE DOG.—HOLLOW.

No. 1,	$\frac{3}{8}$ inch,	$ 35
No. 2,	$\frac{1}{2}$ "	40
No. 3,	$\frac{3}{4}$ "	50
No. 4,	1 "	60
No. 5,	$1\frac{1}{4}$ "	75
No. 6,	$1\frac{1}{2}$ "	90
No. 7,	$1\frac{3}{4}$ "	1 00
No. 8,	2 "	1 10

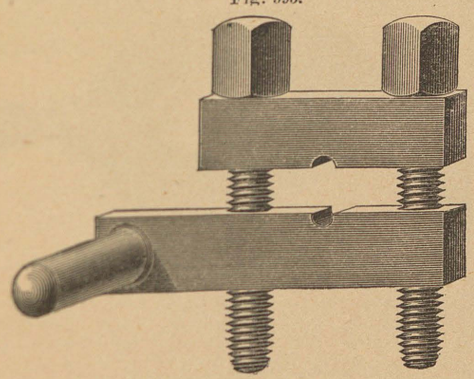
Small Set, $5.60.

No. 9,	$2\frac{1}{2}$ "	1 35
No. 10,	3 "	1 50
No. 11,	$3\frac{1}{2}$ "	1 70
No. 12,	4 "	1 90

Full Set, $12.00.

5 Inch Dog,	3 00
6 " "	4 00
$\frac{1}{4}$ " "	35

Fig. 593.



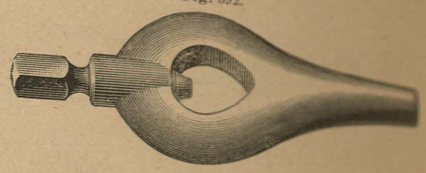
STEEL CLAMP DOG.

These are made from the Steel Bar. They will carry all that can be put on them.

No. 1,	opens 1	inch, $1 25
No. 2,	" $1\frac{1}{2}$	" 1 50
No. 3,	" 2	" 1 75
No. 4,	"	2 00

Full Set, $6.50.

Fig. 592.



STRAIGHT TAIL DOG.

To be driven from a stud in the Face Plate.

It is from the same pattern as the Heavy Steel Dog, and warranted, like that, not to break with any work.

This pattern will stand much more than a Bent Tail, and some prefer them on account of their direct action on the work.

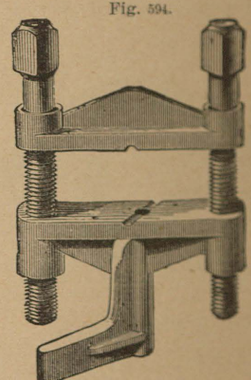
No. 1,	$\frac{3}{4}$ inch	$ 70
No. 2,	$\frac{7}{8}$ "	80
No. 3,	1 "	90
No. 4,	$1\frac{1}{8}$ "	95
No. 5,	$1\frac{1}{4}$ "	95
No. 6,	$1\frac{3}{8}$ "	95
No. 7,	$1\frac{1}{2}$ "	1 10
No. 8,	$1\frac{3}{4}$ "	1 10
No. 9,	2 "	1 40

1 Set to 2 inches, $9 65

No. 10,	$2\frac{1}{4}$ inches	$ 1 60
No. 11,	$2\frac{1}{2}$ "	1 60
No. 12,	3 "	1 80
No. 13,	$3\frac{1}{2}$ "	2 00
No. 14,	4 "	2 20
No. 15,	$4\frac{1}{2}$ "	2 60
No. 16,	5 "	3 50
No. 17,	$5\frac{1}{2}$ "	4 25
No. 18,	6 "	5 00

Full Set, $34 10

Fig. 594.



PATENT CLAMP DOG.

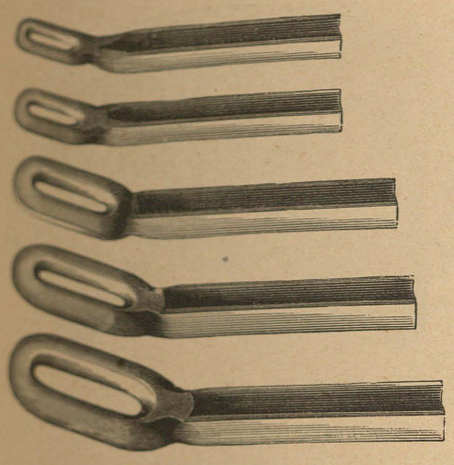
Used for finished work and many other purposes. They are well made, and of four sizes, taking anything from close to the sizes given. Made from Malleable Iron.

No. 1	$1 00
No. 2	1 10
No. 3	1 30
No. 4	1 60

Set of Four, $5.00.

STEEL CHUCK DRILL HOLDER.

Fig. 595.



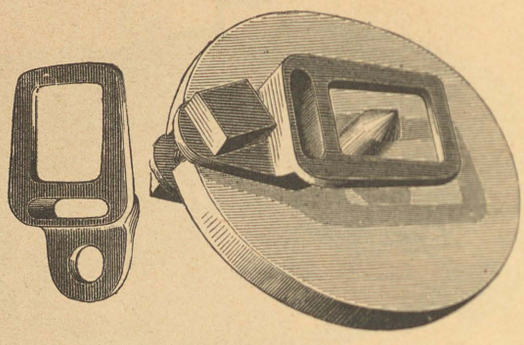
They are of five sizes. The slot is rounded every way, so as to avoid corners that interfere with centering the drill.

PRICES.

No. 1, Taking drills from $\frac{3}{8}$ to $\frac{9}{16}$	$ 0 50
No. 2, " " " $\frac{9}{16}$ to $\frac{3}{4}$	50
No. 3, " " " $\frac{3}{4}$ to $1\frac{1}{8}$	60
No. 4, " " " $1\frac{1}{8}$ to $1\frac{5}{8}$	75
No. 5, " " " $1\frac{5}{8}$ to 2	90
Set	3 25

LeCOUNT'S PATENT BOLT DOG.

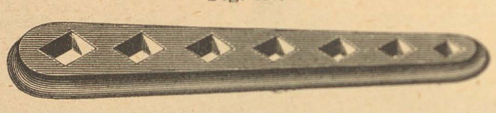
Fig. 596.



Set of 12 sizes, $\frac{5}{16}$ to 2 inclusive $2 50

STEEL DOG WRENCH.

Fig. 597.



Fitting screw heads from $\frac{3}{8}$ to $\frac{3}{4}$ inch square. Will answer for both dogs and tool post.

Price $0 75

TURKISH EMERY, EMERY PAPER AND CLOTH.

EMERY PAPER.

Numbers	00	0	$\frac{1}{2}$	1	$1\frac{1}{2}$	Assorted.
Price per ream	6 50	6 50	6 50	6 50	6 50	6 50

EMERY CLOTH.

Numbers	Crocus	00	0	$\frac{1}{2}$	1	$1\frac{1}{2}$	2
Price per ream	18 00	18 00	18 00	18 00	18 00	18 00	20 00

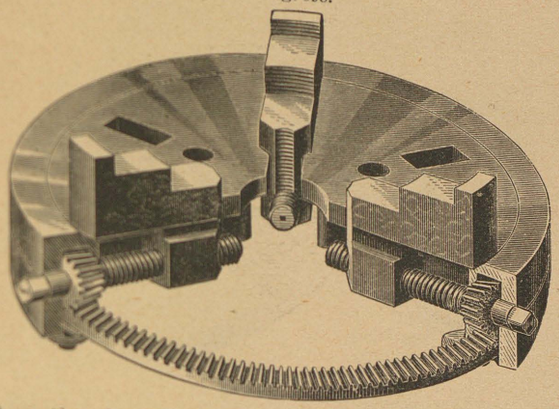
TURKISH EMERY.

Grained, in 10 lb. cans, per lb ..... 15 cents.
" half-kegs, per lb ..... 12 "
" kegs, per lb ..... 10 "
Flour, in 10 lb. cans, per lb ..... 10 "
" half-kegs, per lb ..... 8 "
" kegs, per lb ..... 6 "

Grained Emery comprises Nos. 6, 8, 10, 12, 14, 16, 18, 20, 24, 30, 36, 40, 46, 54, 60, 70, 80, 90, 100, 120, 150.
Flour " " " CF, F, and FF.

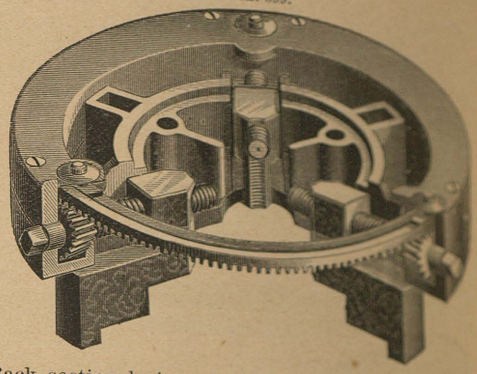
THE SWEETLAND CHUCK.

Fig. 598.



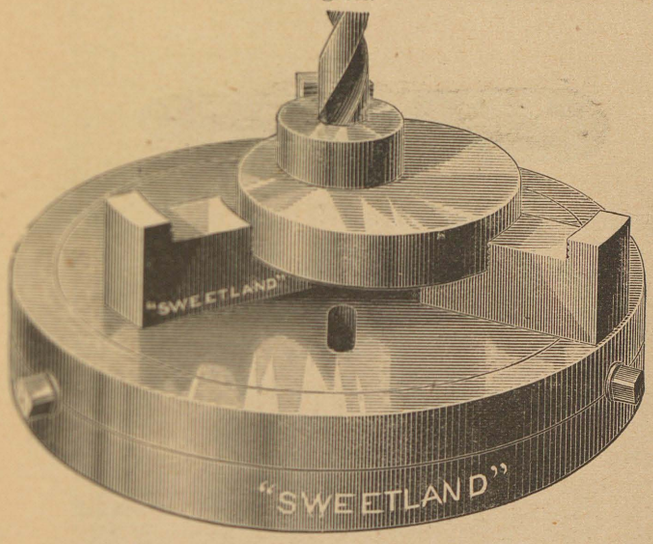
Front sectional view of Chuck, showing the rack, pinion screws and jaws; also the large hole through the center and slots through face for confining extra heavy work.

Fig. 599.



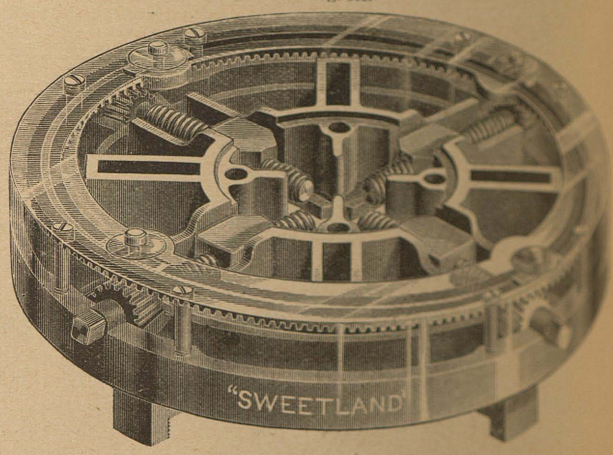
Back sectional view of Chuck, showing the recess in the rack; also the cam blocks which are operated to make the Chuck either universal or independent.

Fig. 600.



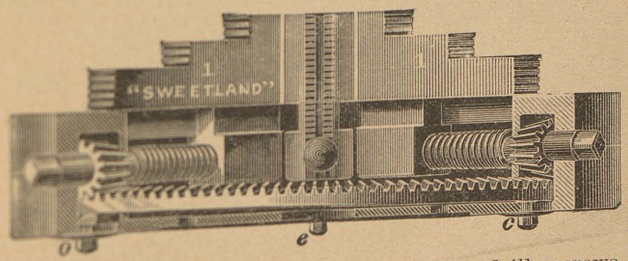
Front view of Chuck holding an eccentric. The line on face is designed for setting the jaws true for universal work.

Fig. 601.



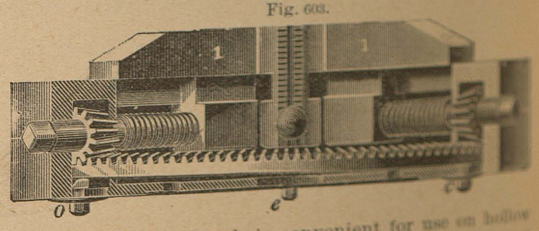
Back view of all Chucks over nine inches in diameter, showing the spring washers in position for universal or independent action; also the recess to which the latheplate is fitted and bolted.

Fig. 602.



The Reverse Jaw Chuck, suitable for holding drills, screws, rods, etc.; also for hand tool work and brass finishing.

Fig. 603.

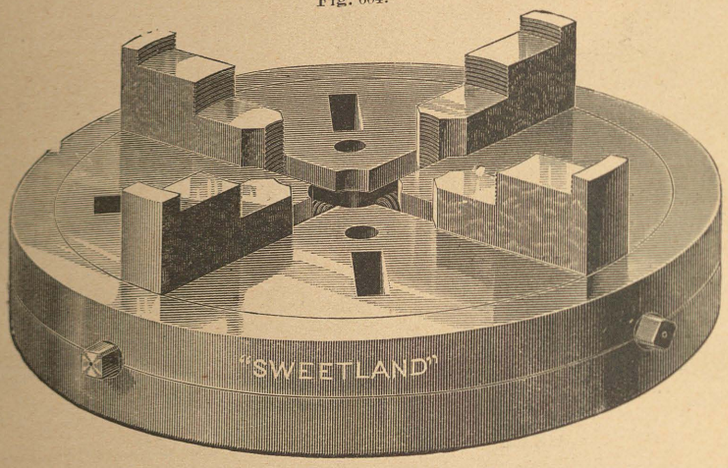


The Inside Jaw Chuck is convenient for use on hollow spindle machines, for holding ordinary and special tools firmly and true.

☞ For Prices see next page. ☜

THE SWEETLAND CHUCK.

Fig. 604.



The preceding page represents the entire mechanism of the Sweetland Chuck. The design of the improvement is to make the chuck independent as well as universal, thus combining two chucks in one. In the recess underneath the rack are the cam blocks, beveled to correspond with the bevel recess in the rack. The cam blocks are held in place by the convex spring washers, which allow them to be moved to or from the center without disturbing the nuts, the friction being sufficient to hold them in place. When moved to the outer portion of the rack they connect the gearing, making the chuck universal; and when moved inward they disconnect the gearing, thus making each screw independent. The advantage of making each screw independent, without disconnecting the others from the gearing, is a feature not combined in any other chuck, and is an improvement fully appreciated by the mechanic when adjusting the jaws for eccentric, concentric, or universal work. For instance, the chuck having been used independent, the workman wishes to change to universal, the jaws are moved inward until the outer end is true with the line on face of chuck; now, each screw can be engaged with the rack separately by sliding the cam block inward. If one jaw is found to be out of true it can be disconnected and reset, leaving the others in mesh undisturbed.

This chuck has a large hole in center, and will allow a drill or reamer to pass through work without injury to face of chuck.

These chucks will be furnished without the combination when so ordered, and when thus supplied will be universal only. They will be known as the "Horton Style."

PRICE LIST.

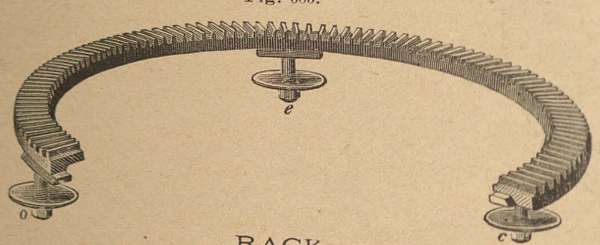
THREE JAWS.

6 inches diameter	$ 26 00
9 " "	34 00
12 " "	44 00
15 " "	52 00
18 " "	62 00
21 " "	80 00
24 " "	100 00
30 " "	170 00
Car Wheels	220 00
	250 00

FOUR JAWS.

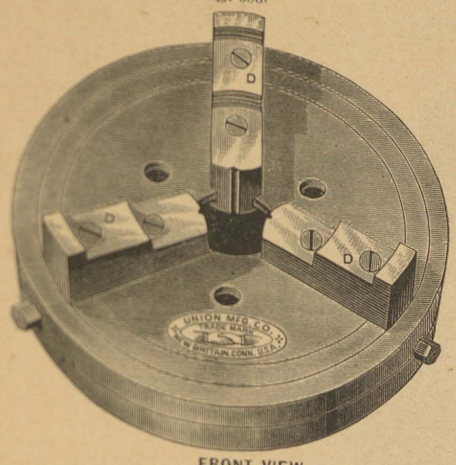
6 inches diameter	$ 32 00
9 " "	42 00
12 " "	56 00
15 " "	64 00
18 " "	75 00
21 " "	95 00
24 " "	120 00
30 " "	200 00

Fig. 605.



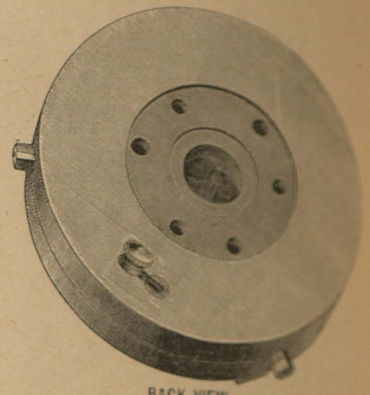
RACK.

Fig. 606.



FRONT VIEW.

Fig. 607.



BACK VIEW.

THE SKINNER CHUCK.

UNIVERSAL, INDEPENDENT, ECCENTRIC.

We beg to call your attention to this Chuck, which was patented June 24th and November 18th, 1879. This Chuck is universal, independent and eccentric. The reputation of this Chuck is that of being the best and simplest in the market, for we are convinced that the trade and the user do not wish an inferior article, and with the improvements as shown in the cuts, we have no hesitancy in saying that it is the best Chuck manufactured, and we guarantee every Chuck of this make perfect in every respect. This Chuck has a large hole in the center which will permit a Reamer or Drill to pass through work without injuring the Chuck. The jaws are ground perfectly true on both face and bite. All parts are made interchangeable, so in case repairs become necessary, we can furnish the part needed without the Chuck being sent us, saving much time and expense. We are prepared to fill promptly, orders for all sizes, with either three or four jaws. Extra sets of jaws, and Chucks for special work, or with special jaws, will be furnished at reasonable prices.

THREE JAWS.

Diameter.	*Price.*	*Diameter.*	*Price.*
4 inch	$ 24 00	18 inch	$ 62 00
6 inch	26 00	21 inch	80 00
9 inch	34 00	24 inch	100 00
12 inch	44 00	30 inch	170 00
15 inch	52 00	36 inch	230 00

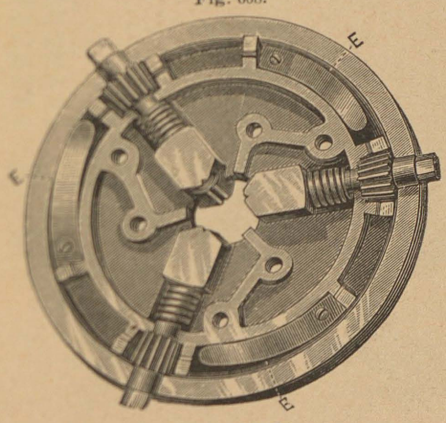
FOUR JAWS.

Diameter.	*Price.*	*Diameter.*	*Price.*
6 inch	$ 32 00	18 inch	$ 75 00
9 inch	42 00	21 inch	95 00
12 inch	56 00	24 inch	120 00
15 inch	64 00	30 inch	200 00

In ordering, please state if the Chuck is wanted with Common, Reverse or Inside Jaws.

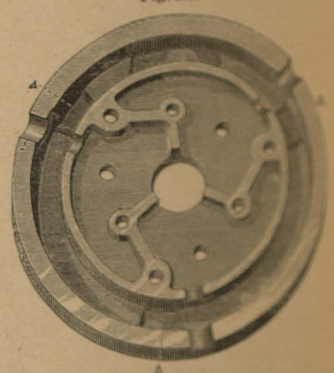
Descriptive Circulars sent on application.

Fig. 608.



FRONT PLATE.

Fig. 609.



BACK PLATE.

NEW INDEPENDENT JAW CHUCK WITH REVERSIBLE JAWS.

Fig. 610.

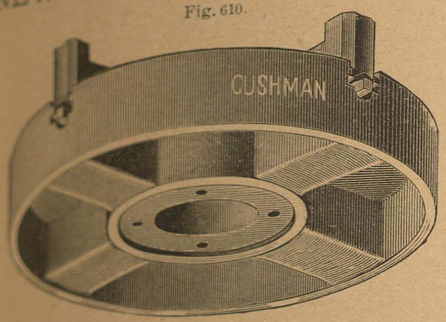
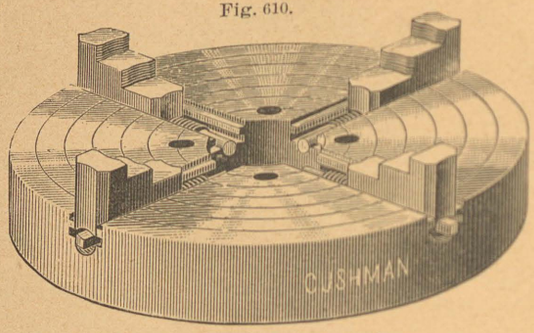


Fig. 610.

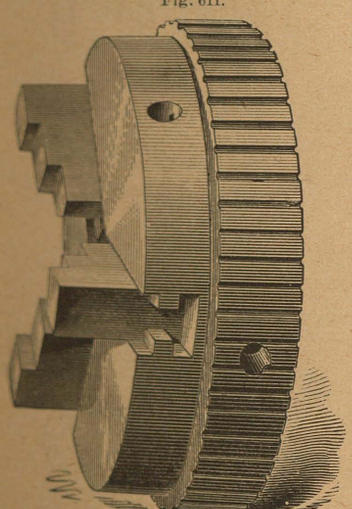


This is a new line of Chucks that have just been put on the market. They are heavier and stronger than the old style, and we do not hesitate to say that they are the best independent Chuck now made. The casting is made heavy and is well proportioned. The screws are made of steel and have long bearings at each end, and in case of the square end being worn, it can be reversed and the other end fitted to the key. The jaws are made of the best quality of wrought iron thoroughly case-hardened, and can be run out and reversed, which is a feature not generally found in other Chucks of this kind. Eleven sizes are made, as below, varying by two inches, thus making a line better adapted to standard lathes. Key and bolts furnished with each Chuck.

Diam. Inches.	Weight. Pounds.	Diam. of Hole. Inches.	Diam. Face-Plate. Inches.	Price.
4	6	1	$4\frac{3}{16}$	$ 14 00
6	11	$1\frac{3}{16}$	$5\frac{1}{16}$	18 00
8	25	$1\frac{7}{8}$	$4\frac{3}{4}$	22 00
10	35	2	$4\frac{3}{4}$	26 00
12	54	3	$6\frac{1}{16}$	30 00
14	72	3	$6\frac{1}{16}$	34 00
16	86	3	$6\frac{1}{16}$	$ 38 00
18	113	4	$7\frac{3}{8}$	44 00
20	122	4	$7\frac{3}{8}$	50 00
22	172	$4\frac{3}{4}$	$9\frac{1}{4}$	57 00
24	193	$4\frac{3}{4}$	$9\frac{1}{2}$	65 00

AMATEUR'S LEVER CHUCK.

Fig. 611.



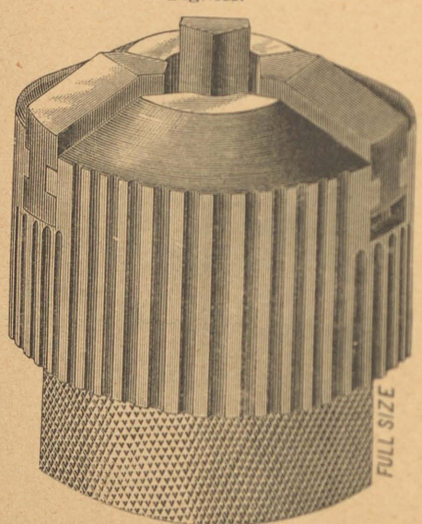
This Chuck is made in but one size, four inches in diameter, and is especially for light work. It weighs three pounds, and has a one-inch hole entirely through. It is well made of good material, and is giving good satisfaction. It is attached to Lathe by face-plate 2⅜ inches in diameter, or it can be screwed on the spindle. Furnished with No. 1 or No. 2 Jaws, same as shown in figured Chucks. Levers and screws furnished with each Chuck.

Price, with either No. 1 or No. 2 Jaws.....$6 50
" Two Sets of Jaws..... 8 00

Levers, screws, etc., included. Always specify in your order the style of jaws wanted, otherwise No. 1 Jaws will be sent.

THE $4.00 DRILL CHUCK.

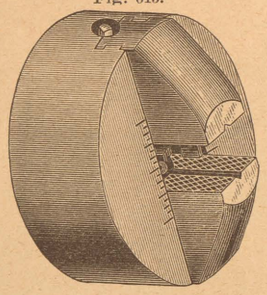
Fig. 612.



Is made all of steel. Holds Drills from 0 to $\frac{5}{16}$. Perfectly true and firm, and is guaranteed to give more satisfaction for the money than any other. A sample sent free on receipt of $4.00, and if not satisfactory after a fair trial can be returned and the money refunded.

LATHE AND DRILL CHUCKS.

Fig. 613.



TWO JAWED CHUCK.

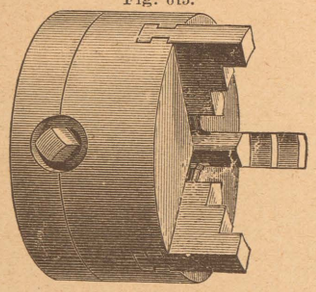
Made with independent jaws or universal jaws.

These chucks are for brass workers, and for holding drills and various other kinds of work that cannot be conveniently held in a three or four jaw chuck. These chucks are 4½ inches diameter, and will open to take in two inches. The jaws stand one inch high from the face of the chucks, and are 1¼ inches wide on the face of jaw, and close together, flat like a vise, with a groove in each jaw, so that a piece can be held by the corners, or straight shank drills, taps or reamers, from ⅛ to 1 inch can be held perfectly true and firm. These chucks are made to be fitted to a face plate, in the ordinary way, and are guaranteed to give satisfaction.

Price List, Including Keys and Screws.

With independent jaws ..... $ 11 00
With universal jaws 12 00

Fig. 615.

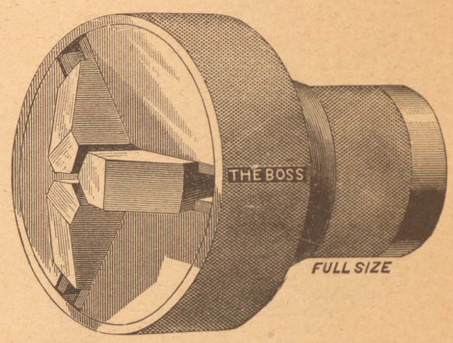


THE AMATEUR GEARED CHUCKS.—(Two-inch).

This is an illustration of a new universal geared lathe and drill chuck called the Amateur Chuck, and is especially adapted to foot lathes and for small work. It can be fitted with ease to any lathe or drill machine, either with a taper plug or a face plate. With No. 2 jaw it holds drills from 1-16 to ⅝, and with jaw No. 1 a piece can be held by the outside as large as the diameter of the chuck. The shell is of malleable iron, the working parts are of steel, and the chucks are made in the most thorough manner. When you order be particular and state if you want No. 1, No. 2, or both sets, No. 1 and No. 2 jaws.

Price, with No. 1 or No. 2 jaws ..... $ 6 00
" " two sets of jaws 7 00

Fig. 614.



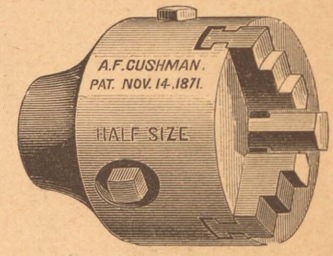
Patented Dec. 24, 1872.

THE "BOSS" DRILL CHUCK.

This chuck holds from 0 to ⅝, is a self-tightening chuck, has been in use ten years, and many thousands have been sold.

Price ..... $ 6 00

Fig. 616.

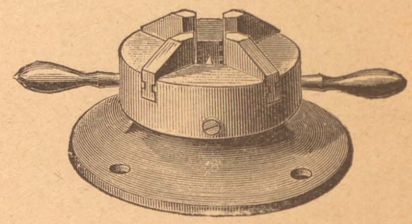


KEY DRILL CHUCK.

This chuck is to take the place of the old key drill chuck, and is much better in every way. It is made having three pinions same as the geared chucks. It holds drills, &c., from 1/64 to ⅝ inch, and can be used for other purposes. We furnish it with No. 1 or No. 2 jaws, same as other chucks, but, unless specified in the order, we will send No. 2 jaws for drills, same as shown in cut.

Price ..... $ 7 50
With two sets of jaws 9 00

Fig. 617.



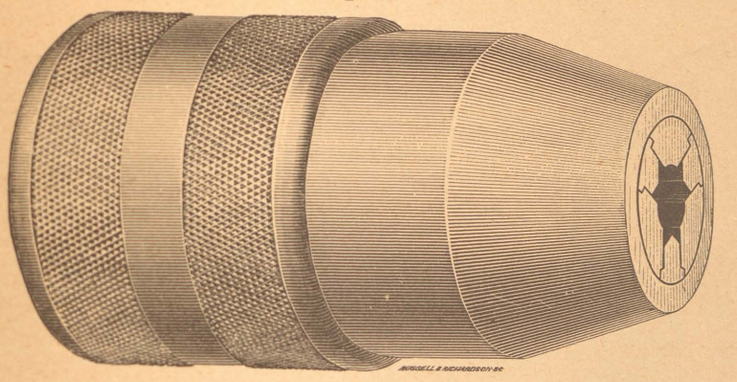
IMPROVED CENTERING CHUCK.

This is simply a scroll chuck with a steel center. It is made to fasten on a bench, and will perfectly center stock from ¼ inch up to 1½ inch, and will operate quicker and more satisfactory than anything ever yet produced for the purpose. It is always ready for use, is very strong, the base and center being of steel and will last a lifetime; and, in an ordinary shop, will pay for itself in less than three months. Some shops now have them in every room, and consider them almost indispensable. It is furnished at a very low price in order to bring it within the reach of all, and it is fully guaranteed in every respect. Give it a trial.

Price, with 3 jaws ..... $ 11 00
With 4 jaws 12 00

BEACH'S DRILL CHUCK—STETSON'S PATENT.

Fig. 618.



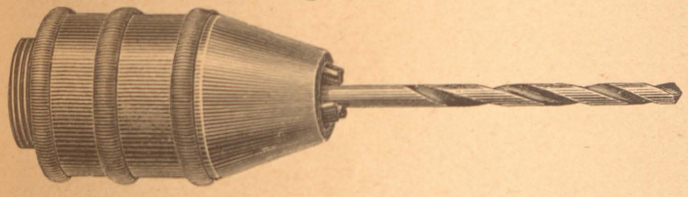
NO. 2. FULL SIZE.

This construction has advantages over the old style, in that the jaws are much stronger, and move in that part of the Chuck which is attached to the driving spindle. Great firmness and accuracy is gained to the Chuck by this arrangement.

The threaded and working parts of the Chuck are covered, and thereby secured from injury or dirt. But one size will at present be made. No. 2, holding from 0 to $\frac{3}{8}$ inch; price, $8.50.

BEACH'S PATENT DRILL CHUCK.

Fig. 619.

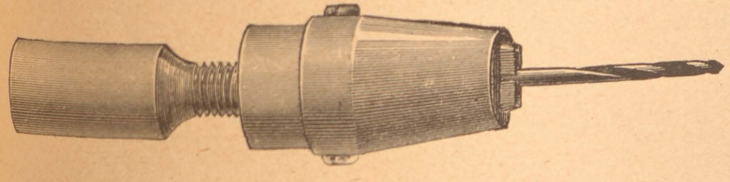


PRICES.

No. 0, holding from 0 to $\frac{1}{8}$ inch diameter (for Jewelers),	$ 8 00
No. 0, holding from 0 to $\frac{1}{4}$ inch diameter,	8 00
No. 3, holding from $\frac{1}{16}$ to $\frac{1}{2}$ inch diameter,	10 00
No. 4, holding from $\frac{3}{16}$ to $\frac{5}{8}$ inch diameter,	11 00

STAR CHUCK.

Fig. 620.



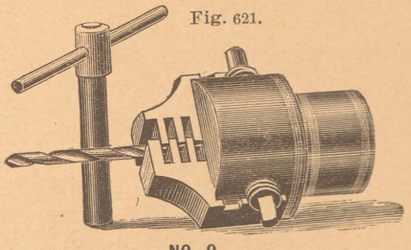
No. 1, with Shank $\frac{1}{2}$ inch in diameter and two inches long, holds Drills from $\frac{1}{64}$ to $\frac{1}{8}$ inch. Price, $1.25 each.

No. 2, with Shank $\frac{5}{8}$ inch in diameter and $3\frac{1}{2}$ inches long, holds Drills from $\frac{1}{32}$ to $\frac{1}{4}$ inch. Price, $2.00 each.

These Chucks are simple in construction, strong and durable, and are warranted to hold the Morse Twist Drills firmly, without danger of breaking. The Shanks (or Mandrels) are centered so they can easily be fitted to any Lathe desired. The above cut represents No. 1, full size (except in length of Shank).

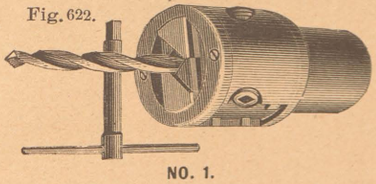
WESTCOTT'S LITTLE GIANT CHUCKS.

Fig. 621.



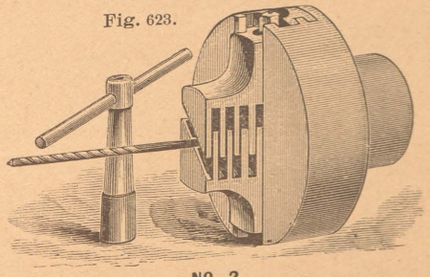
NO. 0.

Fig. 622.



NO. 1.

Fig. 623.

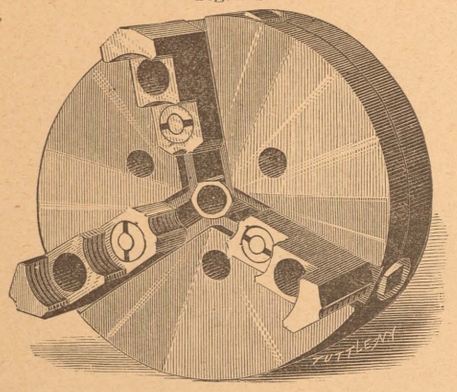


NO. 2.

		Each.
No. 0, 2 in. diam.,	holds from No. 0 to $\frac{3}{8}$,	$ 8 00
No. 1, $2\frac{1}{2}$ "	" " " 0 to $\frac{1}{2}$,	9 00
No. 2, $3\frac{1}{2}$ "	" " " 0 to 1,	10 00

COMBINATION GEARED LATHE CHUCK.

Fig. 624.

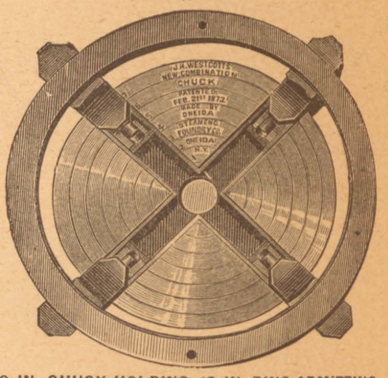


REVERSIBLE JAWS.

This chuck is one which embodies Westcott's latest improvements. The chuck is manufactured under the special supervision of the patentee, and possesses the following advantages over other geared combinations:

1. The jaws are held firmly to the face of the chuck by a stud and nut nearest the end of jaw, which holds the work, and which effectually prevents the jaw from springing, and also prevents all lost motion in the working of the jaw. By means of this improvement the chuck can always be made a perfect universal, which is true of no other chuck, as the strain on an ordinary chuck soon wears the threads of the screws to such an extent as to make it an imperfect tool.

Fig. 625.



9-IN. CHUCK HOLDING 12-IN. RING ADMITTING TURNING ON FACE OR INSIDE.

2. The jaws can be reversed in half the time of any other chuck made, as it is only necessary to take the nut off the stud and replace it after reversing the jaw.

3. Both bite and face of jaws are ground after hardening, leaving a perfectly true surface.

4. The jaws can be adjusted to the 150th part of an inch, or more, according to the size of the chuck.

5. These chucks will hold a piece of work from 1 to 2½ inches larger than rated; at the same time they are no heavier than an ordinary chuck of the same size. All chucks above 12 inch have slots clear through the body, which makes it convenient to bolt work to if required.

6. Your attention is called to the ease with which cheap jaws of cast iron, requiring only shaping and drilling, may be substituted for the regular jaws, whenever you have occasion to do brass work, turn rings, or to meet any of the thousand-and-one exigencies which will arise and which ordinarily require you to have several different chucks.

These lathe chucks are the only ones made where you get reversible jaws without having to order a special set, and where you have no projecting screws in the rim.

DIRECTIONS.

In changing the chuck from independent to universal, bring the jaws out to the surface and adjust the screws to the line; then with a rocking movement of the wrench while pressing on the shifting nut, you will readily roll the rack into gear. The change from universal to independent is made almost instantaneously by sliding a stud on the back of the chuck. When requiring the full power of the chuck, and to make it perfectly true, be careful to take up the slack on each screw.

☞ We will not be responsible for breakage where a longer wrench than we send is used.

PRICE LIST.

THREE JAWS.

Diameter.	*Price.*	*Diameter.*	*Price.*
4 inch	$ 24 00	15 inch	$ 52 00
6 inch	26 00	18 inch	62 00
9 inch	34 00	21 inch	80 00
12 inch	44 00		

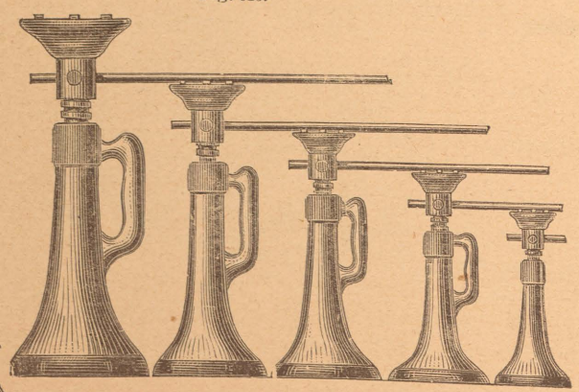
FOUR JAWS.

Diameter.	*Price.*	*Diameter.*	*Price.*
4 inch	$ 30 00	15 inch	$ 64 00
6 inch	32 00	28 inch	75 00
9 inch	42 00	21 inch	95 00
12 inch	56 00		

JACK SCREWS.

Made with wrought iron screws, cast standard, and swivel top.

Fig. 626.



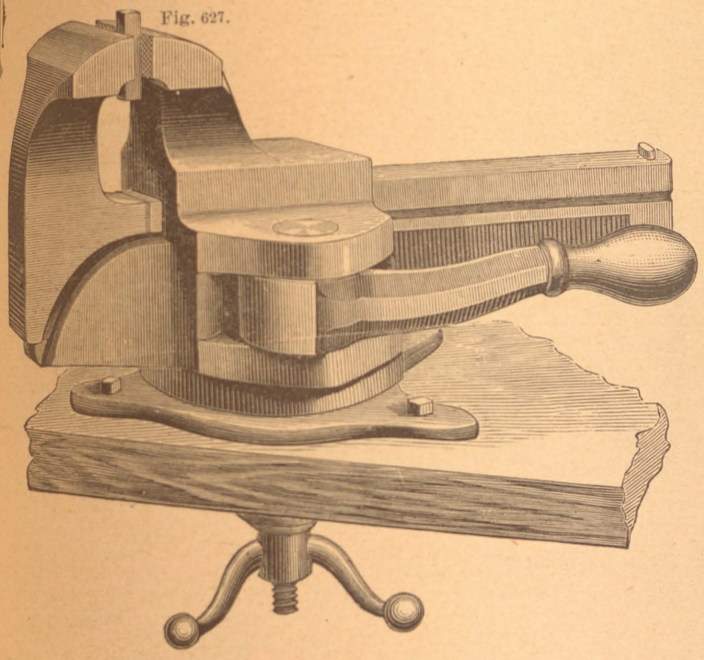
PRICE LIST.

Diam. of screw.	Length of Iron Barrel in inches.								
	6	8	10	12	14	16	18	20	24
1½ inch	4 00	4 75	5 00	5 50	6 00	....	....	....	....
1¾ "	4 50	5 00	5 50	6 00	6 50	8 00	....	....	....
2 "	5 50	5 75	6 50	7 75	8 00	9 50	10 00	10 50	13 50
2¼ "	....	8 75	9 50	10 00	10 50	12 00	12 75	13 50	16 00
2½ "	....	10 00	10 75	11 50	12 00	12 75	13 75	14 75	17 50

Iron Rods charged extra.

STEPHENS' PATENT CAM AND TOGGLE-JOINT VISES.

Fig. 627.



SWIVEL BASE.

SMOOTH OR ROUGH CUT JAWS.

		Price.	Opens, inches.	Weight Lbs.
No. 20, 2 inch Jaw		$ 3 75	2¼	3
No. 21, 2 "	Spring and Anvil	4 50	2¼	3
No. 22, 2¾ "		6 50	3	14
No. 23, 2¾ "	Spring	7 00	3	14
No. 24, 3½ "		10 50	5	42
No. 25, 4½ "		14 50	6½	65
No. 26, 5½ "	Extens'n Handle	26 00	9	120
No. 27, 6½ "	" "	39 00	11	175

Filers' Vises same size and price.

NOTICE.—Should the Vise ever fail to hold securely, it is only because of too much oil and dirt. Clean the parts dry; oil the Hook, *M*, and it is certain to work free, hold firm, and not slip.

FLAT BASE.

SMOOTH OR ROUGH CUT JAWS.

		Price.	Opens, Inches.	Lbs.
No. 1, 2 inch Jaw		$ 3 00	2¼	2
No. 2, 2 "	Spring and Anvil.	3 75	2¼	2
No. 3, 2¾ "		5 50	3	12
No. 4, 2¾ "	Spring	6 00	3	12
No. 5, 3½ "		9 00	5	35
No. 6, 4½ "		12 50	6½	60
No. 7, 5½ "	Extension Handle	22 00	9	110
No. 8, 6½ "	" "	33 00	11	160

Filers' Vises same size and price.

Fig. 628.

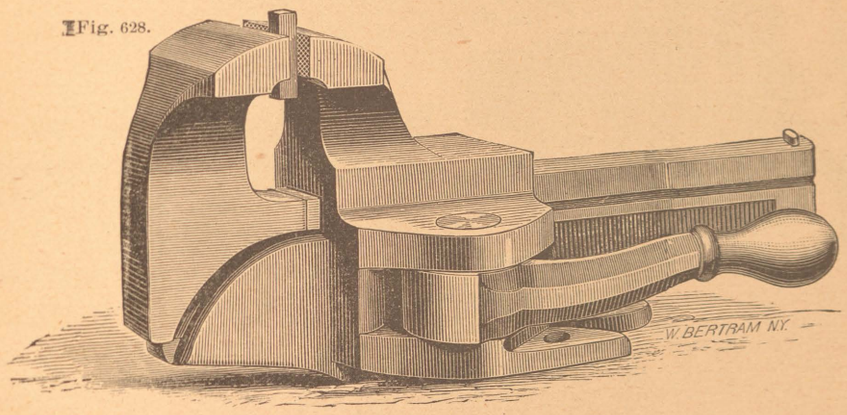
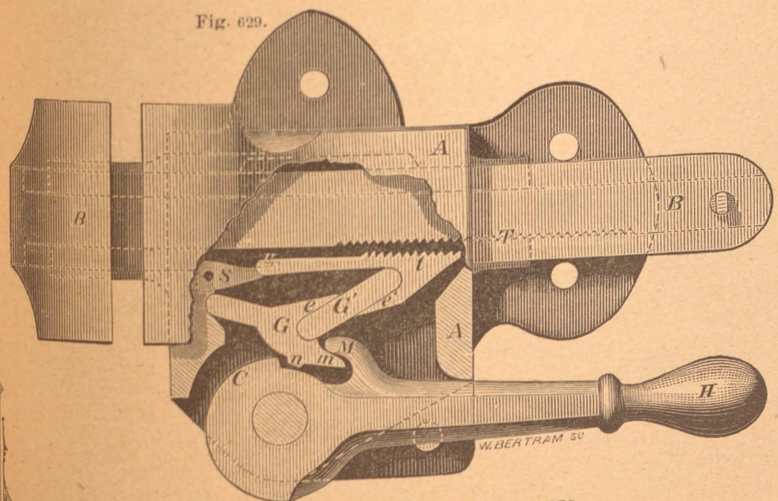


Fig. 629.



SECTIONAL VIEW, SHOWING WORKING PARTS.

It consists simply of a Toggle, *GG*, and Tooth Bar, *t*, held together by a Spring, *S*. The Hook, *M*, and Cam, *C*, on the Handle, *H*, work the Toggle-Joint.

A Steel Rack, *T*, is inserted in the Sliding Bar, *BB*. The Sliding Bar is here seen disengaged, free to be slid either in or out, with perfect ease, to its extreme limits.

At the first move of the Handle outward, the Hook *M* slips from the Tooth, *m*, and the Spring, *S*, draws down upon a hook at *U*, firmly setting the Tooth Bar, *t*, against the Rack, *T*; as the Handle is pulled further outward, the Cam is brought to bear against the ridge, *n*, nearly straightening the Toggle, and forcing the movable jaw with great power against the thing between the jaws.

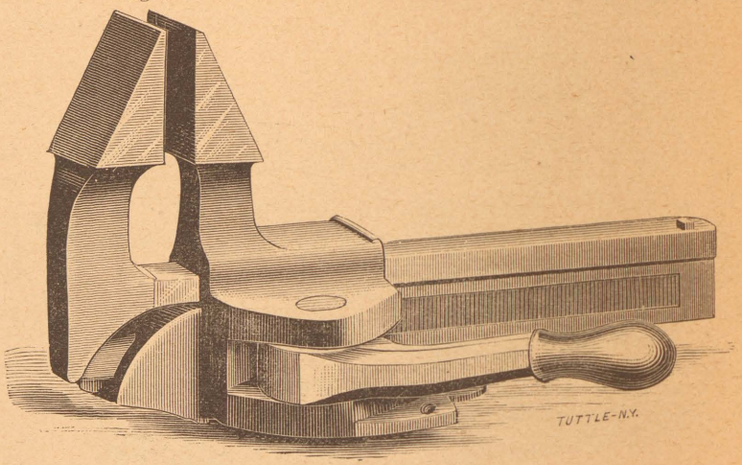
Best Vise for heavy work. All its parts are interchangeable.

DIRECTIONS FOR HEAVY CHIPPING.

First, throw the handle as far back from you as it will go; then slide the bar nearly up to the thing to be held, so that the handle will come about one-half way towards you before the jaws bind. You will find the greatest power in our "Toggle-Joint Vise," for holding the heaviest work, if you understand this point.

NEW IMPROVED COACH OR WAGON-MAKERS' VISE.

Fig. 630.



FLAT BASE.

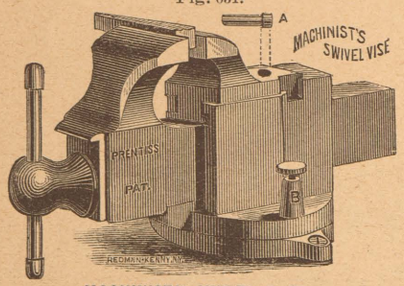
The advantage in the new Coach Vise is its holding capacity. The jaws present a square holding surface equal in width and depth. The distance from top of jaw to the bar is greater and the opening between jaws wider than any Vise in the market.

PRICES.

No. 32, 3½ inch jaw, opens 10 inches, ...$10 00
No. 34, 4½ inch jaw, opens 12 inches, ... 13 50

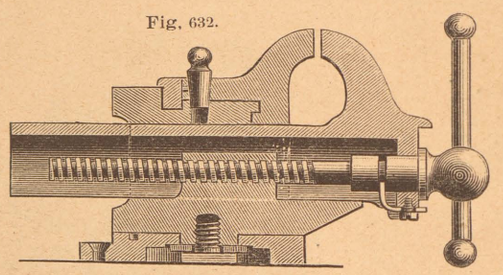
PRENTISS' PATENT VISES.

Fig. 631.



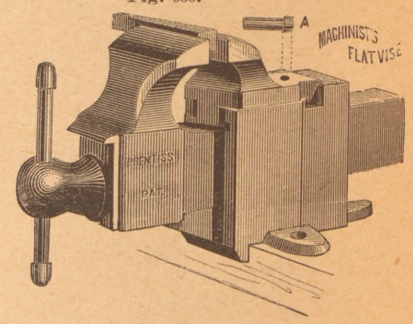
MACHINISTS' SWIVEL BOTTOM VISE.

Fig. 632.



SECTIONAL VIEW, PRENTISS' PATENT VISE.

Fig. 633.



MACHINISTS' FLAT BOTTOM VISE.

MACHINISTS' OR IRON-WORKERS' VISES—Figures 631 and 633.

Width of Jaw.	Weight. Stationary Vise.	Weight. Swivel Vise.	Opens.	Price. Stationary Vise.	Price. Swivel Vise.
2⅝ inches, "Amateur,"	13½ pounds,	17 pounds,	3½ inches,	$ 5 50	$ 6 75
3½ " Machinists',	28 "	32 "	4¾ "	7 00	8 50
4½ " "	54 "	65 "	6 "	10 50	12 50
5¼ " "	96 "	109 "	8 "	17 00	19 00
6 " "	146 "	168 "	9 "	24 00	27 00
7 " "	184 "	207 "	11 "	30 00	35 00

Fig. 634.

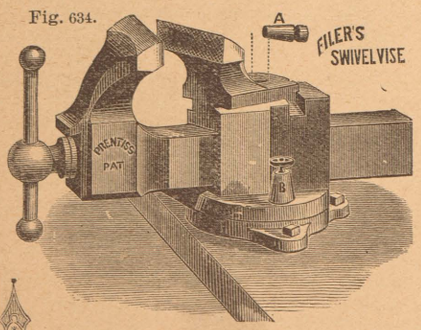


Fig. 635.

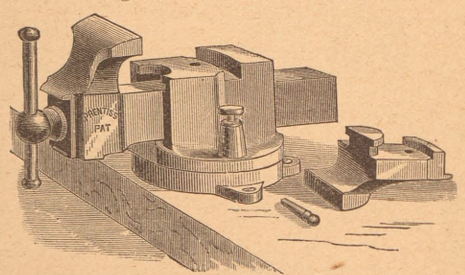
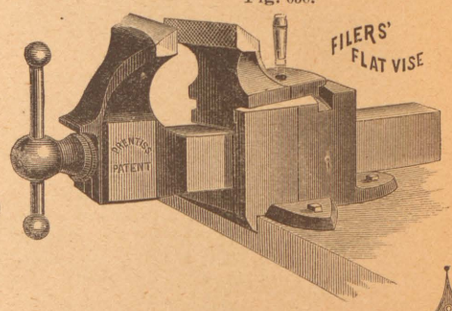


Fig. 636.

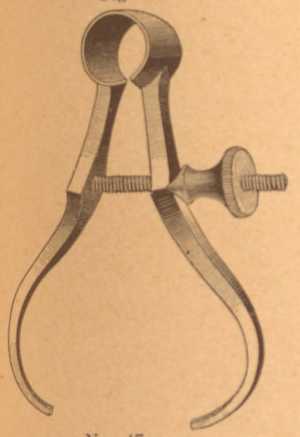


FILERS' AND FINISHERS' VISE.—Figures 634 and 636.

Width of Jaw.	Weight. Stationary Bottom.	Weight. Swivel Bottom.	Opens,	Price. Stationary Bottom.	Price. Swivel Bottom.
4 inches.	32 lbs.	36 lbs.	5 inches.	$8 00	$10 00

STEVENS' SPRING CALIPERS AND DIVIDERS.

Fig. 637.



No. 47.

SPRING SCREW CALIPER.—Fig. 637.

Extra fine steel and temper.

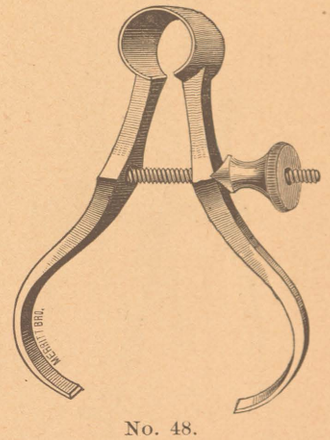
2	inch, per dozen	11 50
2½	" "	11 50
3	" "	11 50
4	" "	14 50
5	" "	15 00
6	" "	18 00

SPR'G SCREW CALIPERS, BROAD POINT.—Fig. 638.

Extra fine steel and temper.

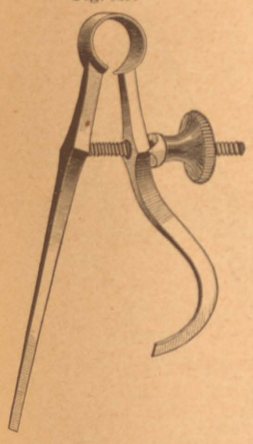
3	inch, per dozen	$ 11 50
5	" "	15 00

Fig. 638.



No. 48.

Fig. 639.



No. 49.

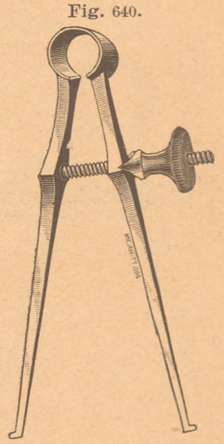
SPRING KEY-HOLE CALIPERS.—Fig. 639.

3½	inch, per dozen	$ 13 75
5	" "	17 50

INSIDE SPRING CALIPER.—Fig. 640.

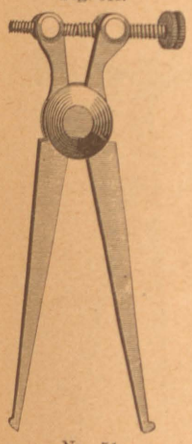
5	inch, per dozen	$ 14 00

Fig. 640.



No. 50.

Fig. 641.



No. 51.

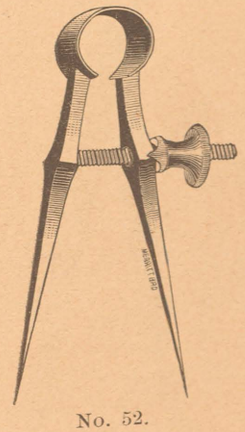
RELIABLE INSIDE CALIPER.—Fig. 641.

5	inch, per dozen	$ 15 00

SPRING DIVIDERS.—Fig. 642.

2	inch, per dozen	$ 11 50
3½	" "	11 50
4	" "	14 50
5	" "	15 00
6	" "	18 00

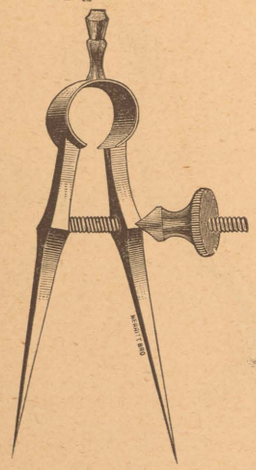
Fig. 642.



No. 52.

STEVENS' SPRING CALIPERS AND DIVIDERS —Continued.

Fig. 643.



No. 53.

SPRING DIVIDERS.—Fig. 643.

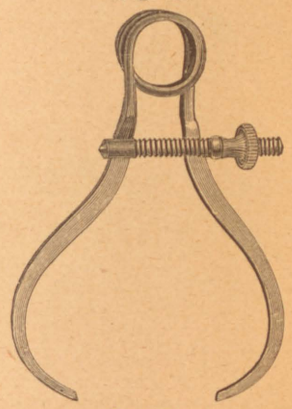
2	inch, per dozen	$ 13 75
3½	" "	13 75
4	" "	16 50
5	" "	17 50

HELICAL COIL SPRING CALIPER.—Fig. 644.

1	inch, per dozen	$ 8 00
1½	" "	8 00
2	" "	8 00
2½	" "	8 00
3	" "	8 00
4	" "	10 00
5	" "	10 00

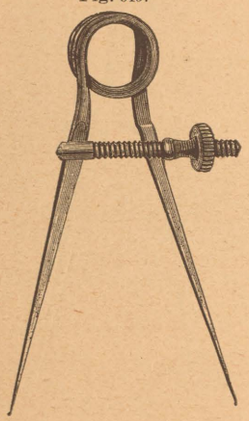
The 1 and 1½ inch are used for charms on watch guards.

Fig. 644.



No. 54.

Fig. 645.



No. 55.

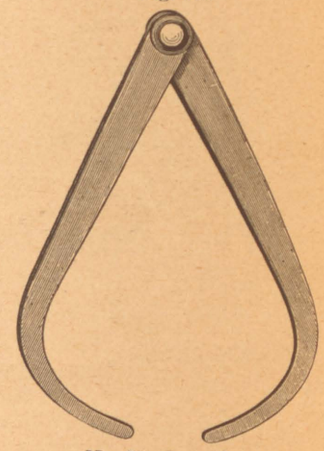
HELICAL COIL SPRING DIVIDERS.—Fig. 645.

3½	inch, per dozen	$ 8 00

FIRM JOINT CALIPERS (Outside).—Fig. 646.

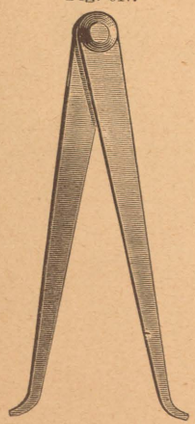
3	inch, per dozen	$ 4 00
4	" "	5 00
6	" "	7 50
8	" "	8 50
10	" "	10 00
12	" "	12 00

Fig. 646.



No. 56 (Outside).

Fig. 647.



No. 56 (Inside).

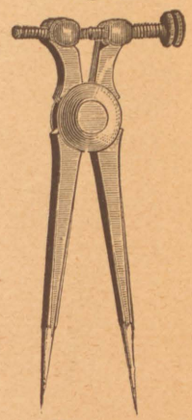
FIRM JOINT CALIPERS (Inside).—Fig. 647.

3	inch, per dozen	$ 4 00
4	" "	5 00
6	" "	7 50
8	" "	8 50
10	" "	10 00
12	" "	12 00

RELIABLE DIVIDER.—Fig, 648.

5	inch, per dozen	$ 24 00

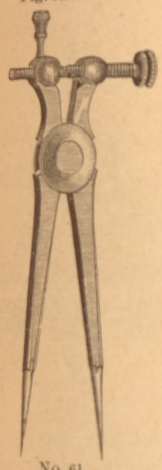
Fig. 648.



No. 60.

CALIPERS AND DIVIDERS. (Continued)

Fig. 649.

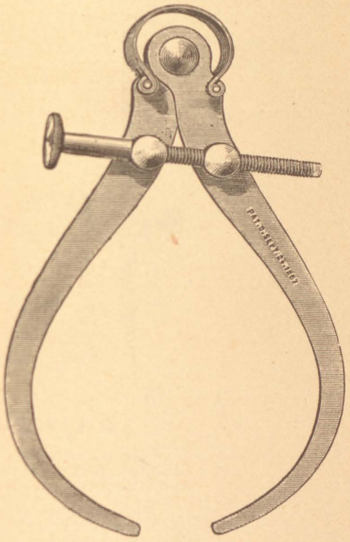


No. 61.

RELIABLE DIVIDER, WITH THUMB ATTACHMENT.

5 inch, price per dozen..... .....$26 00

Fig. 650.

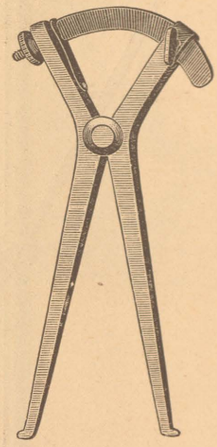


WRIGHT'S CALIPERS.

Inches	3	4	5	6	7
Per dozen	$11 30	$14 50	$15 00	$17 50	$20 00

5 inch Inside Caliper, $15 00

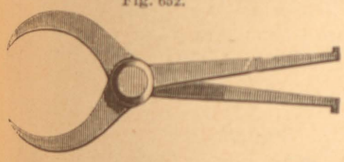
Fig. 651



CALL'S PATENT FINE POLISHED CAST STEEL INSIDE CALIPERS.

4 inch, $9.75 per dozen. 6 inch, $11.00 per dozen.

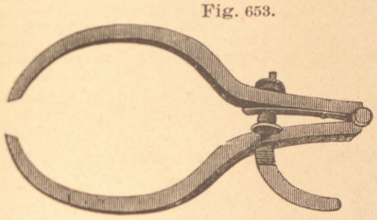
Fig. 652.



FINE POLISHED CAST STEEL DOUBLE CALIPERS.

Inches	2½	4	6
Per dozen	$5 50	$7 00	$9 50

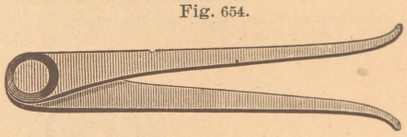
Fig. 653.



FINE POLISHED CAST STEEL WING CALIPERS.

Inches	5	6	8	10	12	15	18
Per dozen	$9 00	$9 50	$11 00	$13 75	$16 50	$27 50	$41 25

Fig. 654.

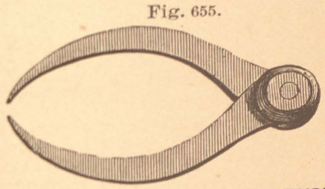


STRAIGHT LEG CALIPERS.

OUTSIDE AND INSIDE.

Bright—inches	4	6	9	12
Per dozen	$6 50	$8 00	$11 00	$15 00

Fig. 655.



FINE POLISHED CAST STEEL INSIDE OR OUTSIDE CALIPERS.

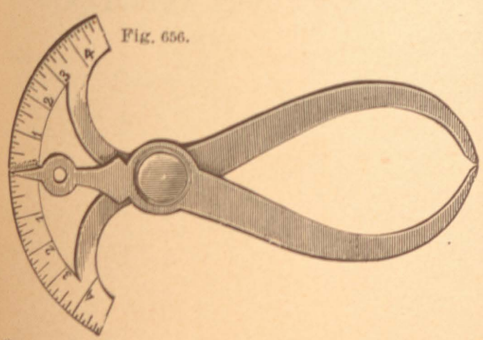
BRIGHT.

Inches	2½	4	6	9	12	15	18	20
Per dozen	$5 00	$6 50	$8 00	$11 00	$15 00	$25 00	$35 00	$45 00

BLACK.

Inches	2½	4	6	9	12	18	20
Per dozen	$4 00	$5 25	$6 50	$8 50	$11 50	$26 75	$34 00

Fig. 656.



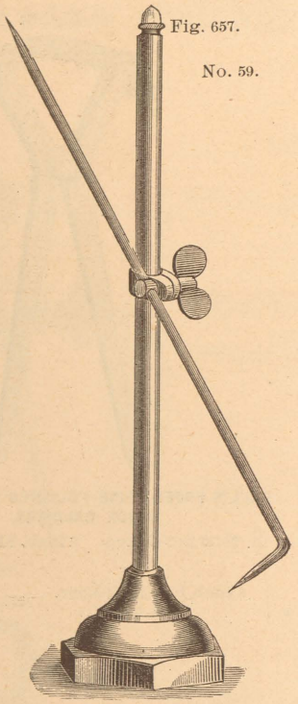
REGISTERING CALIPERS.

Length	3	4	5	6
Plain, per dozen	$5 50	$6 25	$8 00	$ 9 00
Nickel Plated, per dozen	6 00	7 00	9 00	10 00

GAUGES.

Fig. 657.

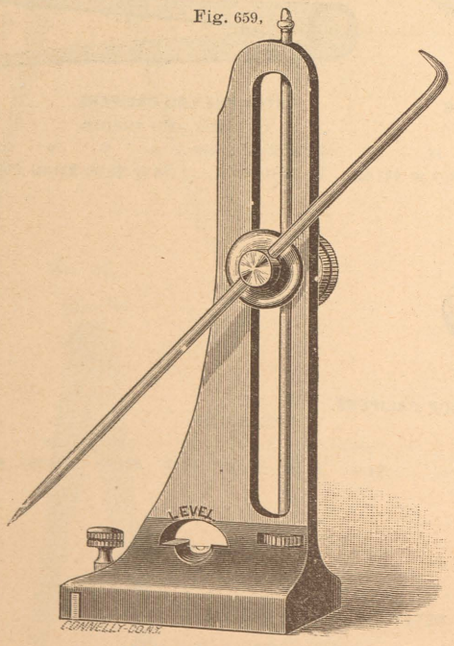
No. 59.



SURFACE GAUGE.

13 inch, Small Size, price per dozen.....$21 00
18 inch, Large Size, " " " 24 00

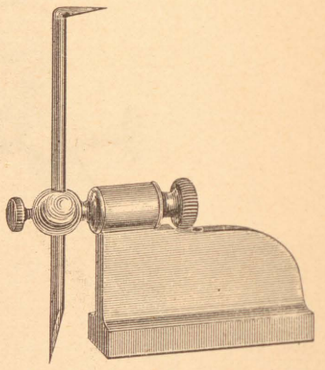
Fig. 659.



SURFACE GAUGE.

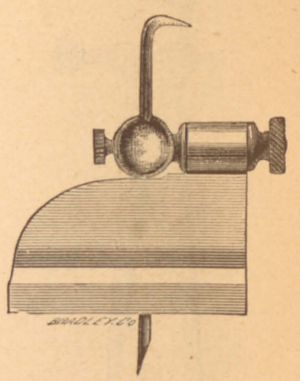
This Tool is provided with an adjustable attachment for the quick and accurate adjustment of work on a line with the bed of a Planer, or parallel to its edge. It is also provided with a Spirit Level, making it a very convenient level and plumb as well as the best Surface Gauge made for Machinists' use. 8-inch, price $2.50.

Fig. 658.



No. 1.

Fig. 658.



No. 58.

Fig. 658.

No. 2.

HATHAWAY'S COMBINATION GAUGE.

The various uses to which this little instrument can be applied place it in the estimation of all who have used it, as one of the most useful tools known to mechanics.

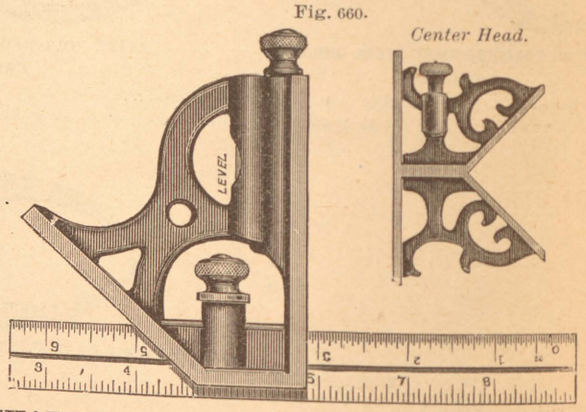
No. 1 represents a Surface Gauge, capable of being set with the greatest accuracy, and, being strong, is not liable to spring or change from its position. In this form it can also be used to find the center of pieces for lathe work. Place the Gauge upon a surface plate, bring the piece to be centered in contact with the scratch, and the center will be accurately determined, thus saving the trouble of revolving the piece upon centers.

No. 2 represents the same as a depth gauge; this is done by unscrewing the binding nut and reversing the barrel, thus making a really valuable tool for all purposes of planing where perfect accuracy is indispensable, such as dovetailing, fitting slide rests, etc. Should the depth to be gauged exceed the length of the pointer, it can be replaced by a piece of Stubbs' wire.

Another important feature belongs to No. 2. By reversing the pointer it becomes a Scratch Gauge. Price, per dozen, $36.00.

Fig. 660.

Center Head.



CHAPLIN'S PATENT TRI-SQUARE AND MITRE SPIRIT LEVEL AND PLUMB.

PLAIN.

	Set Complete.	Mitre Head and Blade.	Center Head and Blade.
4 inch, without Level		$1 00	
6 " with Level		1 65	$1 50
9 " " "	$ 2 50	2 00	1 80
12 " " "	3 00	2 50	2 25
	3 50		

NICKEL PLATED.

4 inch, without Level		1 25	
6 " with Level		2 00	1 90
9 " " "	3 00	2 40	2 25
12 " " "	3 60	3 00	2 75
	4 25		

Fig. 661.

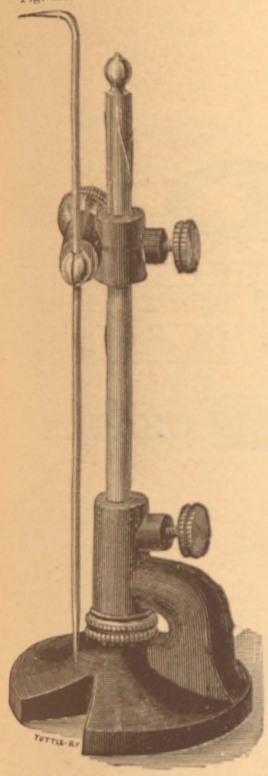
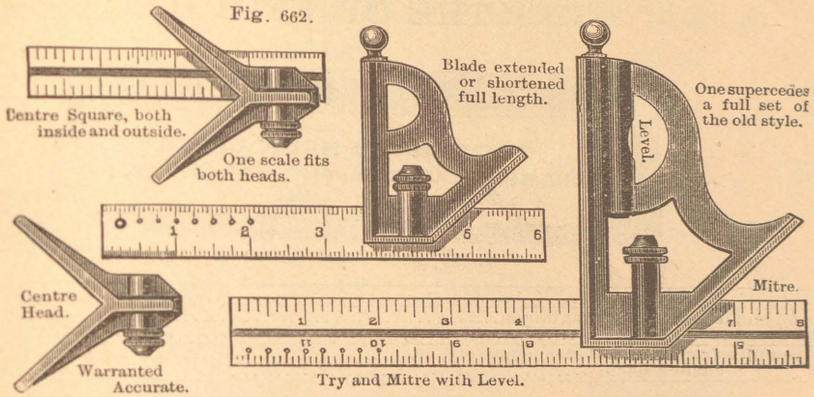


Fig. 662.



Try and Mitre with Level.

STARRETT'S PATENT.

PRICE PER SET.

12 inch, complete			$ 3 50
9 "	"		3 00
6 "	"		2 50
4 "	without center head or level		1 00

PRICE OF SEPARATE PARTS.

12 inch	Scale,	$ 1 00	Stock,	$ 1 50	Center Head,	$ 1 00
9 "	"	75	"	1 25	"	"	1 00
6 "	"	65	"	1 10	"	"	75
4 "	"	50	"	50	"	"	....

STARRETT'S PATENT SURFACE GAUGE.—Fig. 661.

Advantages over others:

1st. Easily obtaining friction to prevent the scriber from moving, by means of a tapering eye bolt drawn into a socket.

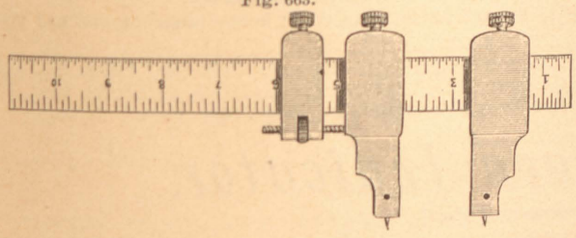
2d. In having stock taken from base, allowing scriber to extend through for depth gauge, while, with bent end down, work may be laid out close to base.

3d. In the final and accurate adjustment of the scriber, the spindle passing through a nut in the base, or raise or lower the same.

No. 1, 8-inch, price ..... $ 2 00 No. 2, 12-inch, price ..... $ 2 75

18 or 24 inch spindles with No. 2 base made to order. Price, $3.00 and $3.25.

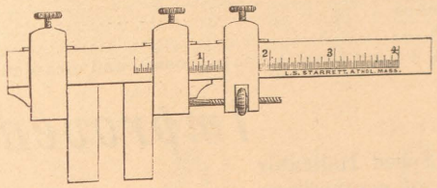
Fig. 663.



STANDARD CALIPER GAUGE.

6 inch....$ 3 00.....9 inch....$3 50....12 inch....$4 00

Fig. 664.

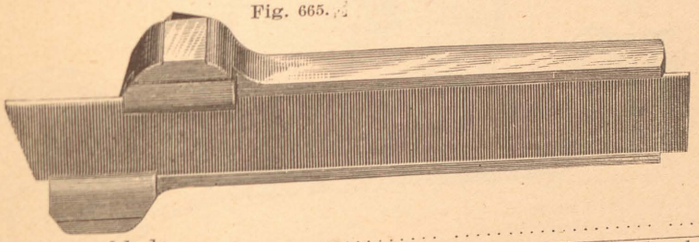


STARRETT'S CALIPER GAUGE.

6 inch.....$3 00....9 inch.....$3 50.....12 inch....$4 00

SLADE'S PATENT CUT-OFF TOOL FOR LATHE USE.

Fig. 665.

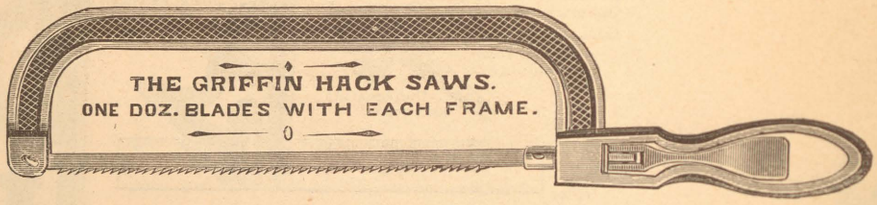


Price, including one blade $2.50

Size of blades	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{8}$	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{7}{32}$	$\frac{1}{4}$
Price	$ 0 25	.25	.30	.35	.40	.45	.50

THE GRIFFIN HACK SAW.

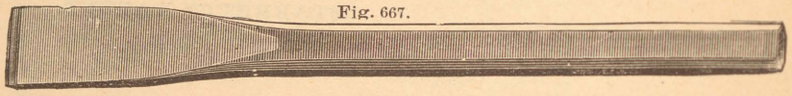
Fig. 666.



Inches	6	7	8	9	10	12
Frame and one dozen blades, per dozen	$ 14 00	15 00	16 00	17 00	.....	.....
Extra blades, per doz	60	65	70	75	.....	.....
Stubbs' Genuine frames and blades, complete, each	1 75	2 00	2 25	2 50	2 75	3 25
" " " blades, each	20	25	30	35	40	50

COLD CHISELS.

Fig. 667.



Size	3/8	1/2	5/8	3/4	7/8	1
Price, per dozen	2 00	2 50	3 25	4 25	5 60	8 35

Assorted sizes, 3/8 to 1 in, per doz., $3.50. These chisels are made from best quality cast steel, and are fully warranted.

Fig. 668.

THE DAVIS IRON MACHINISTS' LEVEL.

Fig. 669.

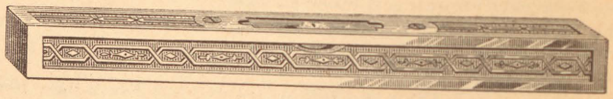
INCLINOMETER. $1.00 each.

Sizes, inches	6	12	18	24
Price, per doz	$18 00	30 00	36 00	42 00

Fig. 670.

NO. 10, MACHINISTS' LEVEL.

Fig. 671.



NO. 11, POCKET LEVEL.

No. 10, Rosewood, selected wood. Level and Plumb; brass side views; brass corner rods; heavy brass top and end plates; polished. (The 6½ inch level has no plumb).

Length, inches	6½	8	10	12
Price, each	$ 1 10	2 00	2 40	2 60

No. 11. Pocket Level, brass embossed and nickel plated. 6 inches long, 5/8 inch square. Price, each, $1.50.

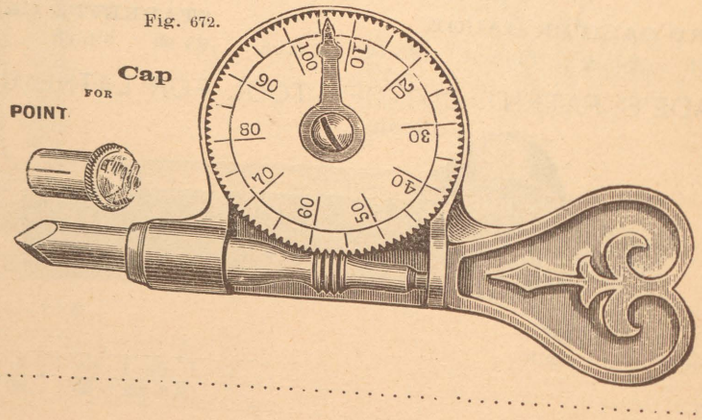
Improved Speed Indicator.

[Cut represents full size.]

This Speed Indicator is made of composition with steel screws or spindle, finely finished, and of convenient size to carry in the vest pocket. The cut shows a metallic cap to protect the point, and also the pocket.

It is always accurate, and for style, finish and durability, it is without a rival.

Fig. 672.

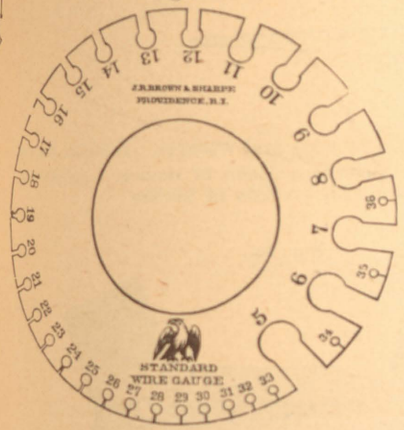


To ascertain the No. of revolutions of any shaft in any given time, place the point in the center of shaft, and for every hundred revolutions the dial will revolve once. Less than 100 will be indicated by the pointer which is to be placed at 100 before starting.

Price, each $1 00

DARLING, BROWN & SHARPE'S MACHINISTS' TOOLS.

Fig. 673.



Full Size.

THE AMERICAN STANDARD WIRE GAUGE.

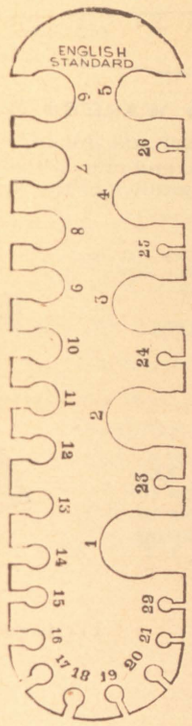
Adopted by the Brass Manufacturers Jan., 1858.

These Gauges are made from the best steel, and are tempered, adjusted and warranted accurate.

None genuine unless stamped in the engraving with the trade mark.

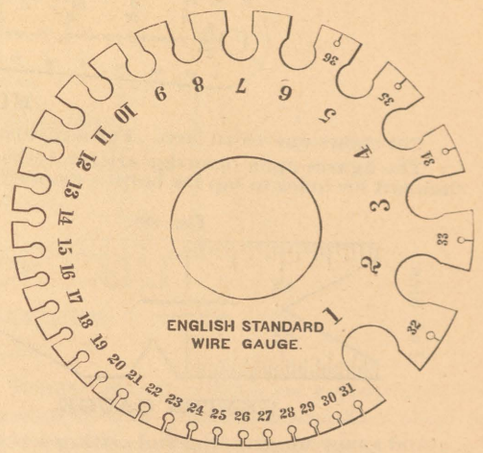
Prices—Round Gauges, sizes, 0 to 36.....$4 00
" " " 5 to 36..... 3 00

Fig. 674.



No. 4 Oblong.—English Standard.
From No. 1 to No. 26.
Price each.....$1 50

Fig. 675.



Two-thirds Size,

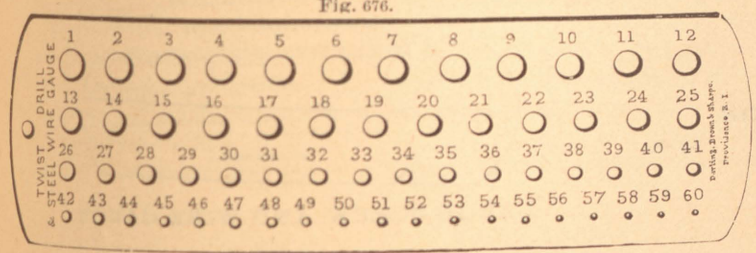
THE ENGLISH STANDARD WIRE GAUGE.

Price $2 00

Sizes and Numbers of English Standard Wire Gauge in decimal parts of an inch.

No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.
0000	.454	11	.120	25	.020
000	.425	12	.109	26	.018
00	.380	13	.095	27	.016
0	.340	14	.083	28	.014
1	.300	15	.072	29	.013
2	.284	16	.065	30	.012
3	.259	17	.058	31	.010
4	.238	18	.049	32	.009
5	.220	19	.042	33	.008
6	.203	20	.035	34	.007
7	.180	21	.032	35	.005
8	.165	22	.028	36	.004
9	.148	23	.025		
10	.134	24	.022		

Fig. 676.



TWIST DRILL AND STEEL WIRE GAUGE.

FOR GAUGING MORSE'S TWIST DRILLS AND STUBBS' DRAWN STEEL WIRE.

Price, $2.50.

Dimensions of Sizes of Gauge in decimal parts of an inch.

No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.	No.	Size of No. in Decimals.
1	.227	11	.188	21	.157	31	.120	41	.095	51	.066
2	.219	12	.185	22	.155	32	.115	42	.092	52	.063
3	.212	13	.182	23	.153	33	.112	43	.088	53	.058
4	.207	14	.180	24	.151	34	.110	44	.085	54	.055
5	.204	15	.178	25	.148	35	.108	45	.081	55	.050
6	.201	16	.175	26	.146	36	.106	46	.079	56	.045
7	.199	17	.172	27	.143	37	.103	47	.077	57	.042
8	.197	18	.168	28	.139	38	.101	48	.075	58	.041
9	.194	19	.164	29	.134	39	.099	49	.072	59	.040
10	.191	20	.161	30	.127	40	.097	50	.069	60	.039

Fig. 677.

Fig. 678.

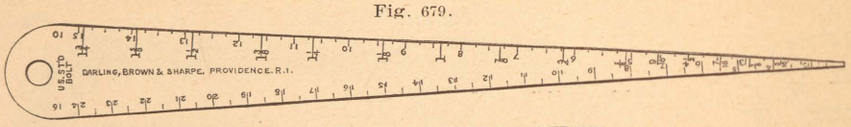
WATCH GUARD CHARMS.

These are one-inch steel Rules and small Center Gauges, furnished with Split Ring to attach. The prices are as follows:

Centre Gauge or Steel Rule, Plain, with Ring, 30c. ea.
Same, Nickel Plated..... 40c. "
" Silver " ..... 50c. "
" Gold " ..... 75c. "

DARLING, BROWN & SHARPE'S MACHINISTS' TOOLS.

Fig. 679.

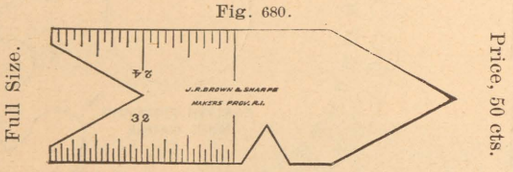


NUT AND WASHER GAUGE.

Cut shows one-third size. For measuring diameter and thickness, also holes of nuts and washers. PRICE, $6 00.

The figures upon one edge are for 16ths and 32ds, and one on the other for 10ths and 20ths of inches. Also U. S. standard for holes to tap for bolts. Opposite side is graduated the same as a steel rule to 32ds of inches.

Fig. 680.

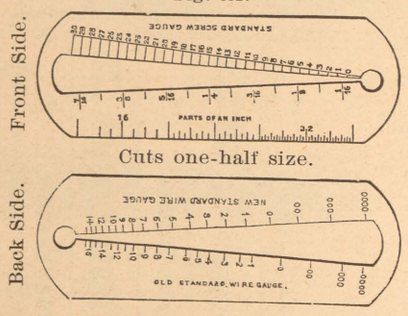


CENTER GAUGE.

And gauge for grinding and setting screw tools.

The angles used in this gauge are 60 degrees. The four divisions upon the gauge of 14, 20, 24, and 32 parts to the inch, are very useful in measuring the number of threads to the inch of taps and screws. The following parts to the inch can be determined by them, viz: 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, and 32.

Fig. 682.

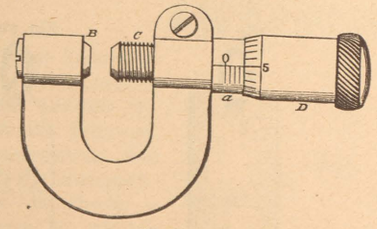


Cuts one-half size.

POCKET SCREW AND WIRE GAUGE.

Price.....$3 00

Fig. 684.



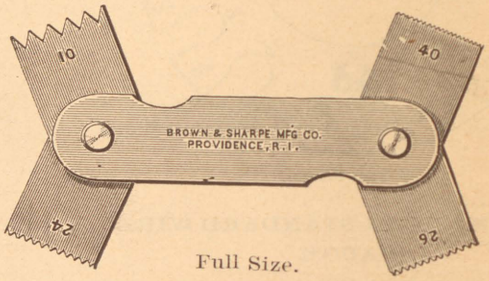
(Full Size).

POCKET SHEET METAL GAUGE.

These gauges will measure the thickness of sheet metal or other material, by thousandths of an inch up to three-tenths of an inch at any point within half an inch of the edge, and can be applied as easily as the common gauge. It will also answer to measure the diameter of wire. Means of adjustment are provided in case of wear by continued use.

Price.....$ 5 00
In Morocco case..... 5 50

Fig. 681.

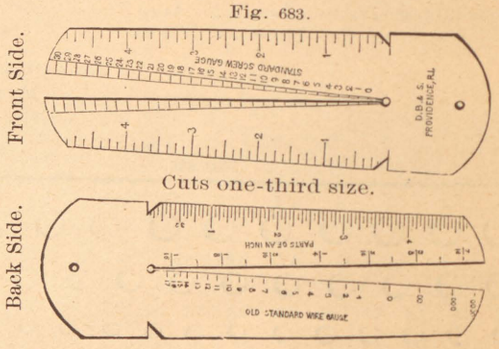


Full Size.

SCREW PITCH GAUGE.

For 16 pitches. Price.....$1 00

Fig. 683.

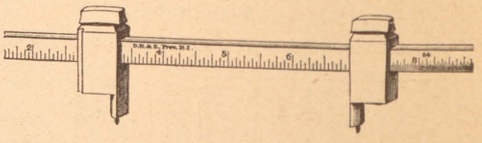


Cuts one-third size.

LARGE SCREW AND WIRE GAUGE.

Price, $3.50. Extra thick, $4.50.

Fig. 685.



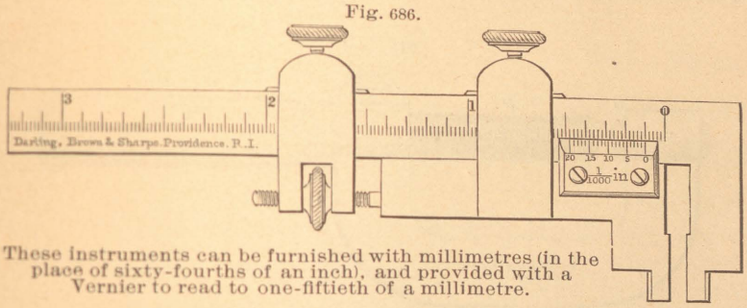
COMBINED GAUGE AND CALIPER.

This tool combines dividers, inside and outside calipers, and a graduated double scratch gauge. It will caliper a round bar two inches in diameter. the beam is 12 inches long, one-half inch wide, three-eighths inch thick, and is graduated to 16ths, 32ds, and 64ths of an inch.

Price.....$5 00

DARLING, BROWN & SHARPE'S MACHINISTS' TOOLS.

Fig. 686.



These instruments can be furnished with millimetres (in the place of sixty-fourths of an inch), and provided with a Vernier to read to one-fiftieth of a millimetre.

IMPROVED POCKET VERNIER CALIPER.

Price, $12.00; in Morocco Case, $12.50.

The cut is a fac-simile of one side of the hardened cast steel Improved Vernier Caliper, a light, convenient and valuable instrument for Machinists' and Tool-makers' use in obtaining correct measurements. The side represented above is graduated upon the bar to inches and fiftieths of an inch, and by the aid of a Vernier is read to one-thousands of an inch. The opposite side is graduated to inches and sixty-fourths of an inch. The outside of the jaws are of suitable form for taking inside measurements, and when the jaws are closed measure 250 one-thousandths of an inch in diameter. This Caliper will measure one inch and eleven-sixteenths, outside diameter, when the jaws are opened full size.

Fig. 687.

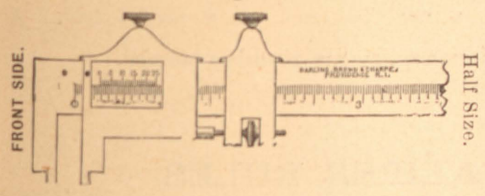
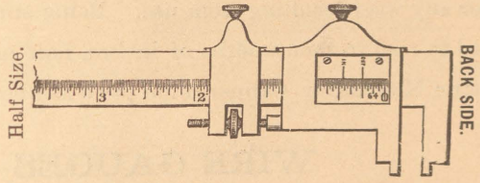


Fig. 688.

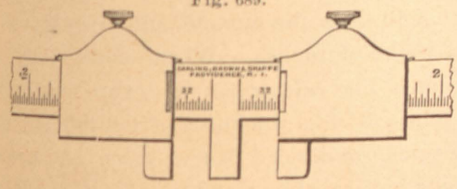


IMPROVED VERNIER CALIPER.

The above cut is a fac-simile of one side of the Vernier Caliper, which reads to thousandths of inches. On the other side are sixty-fourths of inches, to read without a Vernier. Instead of sixty-fourths of inches, some are divided with a Vernier, reading to twentieths of millimetres, French measure. This instrument is furnished with both inside and outside Calipers, and points to transfer the distance with Dividers. An explanation of the Vernier accompanies each instrument. These instruments are made of steel, and have the points tempered and jaws ground.

Price, in Morocco Case—6 inches, $20.00; 12 inches, $25.00; 24 inches, $ 30.00.

Fig. 689.

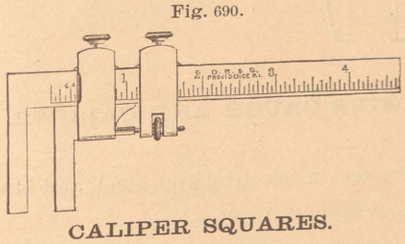


DOUBLE CALIPERS.

Price, $12.00.

Whole length, 7½ inches, and will caliper 3½x4½ inches. Weighs but four ounces, and can be readily carried in the pocket. Very useful for Machinists and others, for selecting iron and steel, as both the width and thickness of flat bars can be tested at once. A larger size, with heavier bar and wood handle is made for use in rolling or forging iron or steel. Extreme length, including handle 12 inches, and will caliper 3½x1½ inches. Price, $18.00.

Fig. 690.



CALIPER SQUARES.

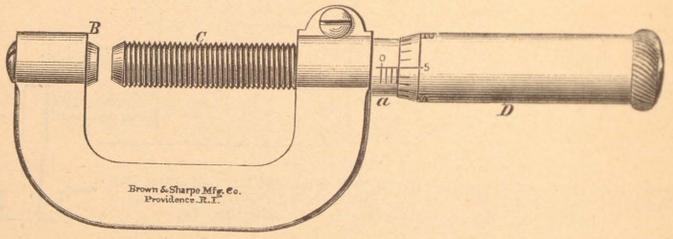
One side divided to 64ths, the other to 100ths of inches.

2 inch, without adjusting screw,		$ 3 00
4 "	" " "	4 00
9 "	" " "	10 00
2 "	with adjusting screw like cut	4 00
4 "	" " " "	5 00
9 "	" " " "	12 00

We also furnish four-inch Caliper Squares, with adjusting screw, with hardened jaws, used by United States steamboat inspectors for measuring boiler plate. Price, $6.

DARLING, BROWN & SHARPE'S MACHINISTS' TOOLS.

Fig 691.



MICROMETER CALIPER, FOR MACHINISTS' USE.

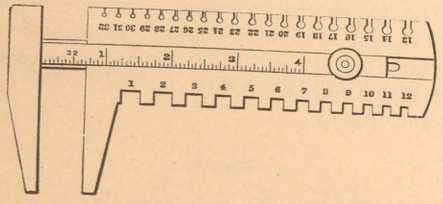
Price.....$ 6 00 In Morocco Case.....$ 6 50

For all sizes less than one inch in diameter, this caliper will be found a reliable and convenient substitute for the Vernier caliper, and will prove invaluable to tool makers, and to machinists engaged on small and fine work. Its accuracy and convenience for the purposes for which it is designed will be appreciated at once by those whose work requires such a tool. The binding and adjusting screws furnish the ready means of compensating for any wear resulting from use. Being small and light it may be used as a pocket tool. Although graduated to read to thousandths of inches, half and quarter thousandths are readily obtained.

Metric Micrometer Caliper same price as above.

WIRE GAUGES AND CALIPER RULES.

Fig. 692.



WIRE GAUGE AND CALIPER.

For store use in selecting iron, steel, and sheet stock, also for iron and steel rollers' use.

Price.....$ 8 00

The wire gauge sizes are from Nos. 1 to 32, inclusive, old standard. The caliper tongue is graduated to inches and 32ds, and will measure 4-in. flat, round, or square stock. The jaws and wire gauge are hardened.

Fig. 693.

STEEL CALIPER RULES.

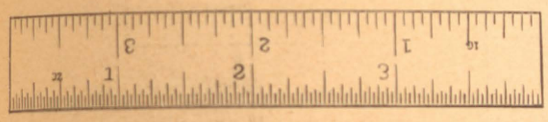
This cut is a fac-simile of one side of these rules. The other side is divided to 12ths, 24ths, 48ths, 8ths, 14ths and 28ths, on the outside, and upon the slide to 32ds and 64ths of inches. When closed they are 3 inches long. The caliper can be drawn out to measure $2\frac{1}{2}$ inches. The thickness of the rule is $\frac{1}{8}$ inch.

These rules are divided in four ways. A, divided on outside like cut, on slide to 32ds and 64ths. B, divided on outside like cut, on slide to 64ths and 100ths. C, divided on outside to 8ths, 16ths, 32ds, and 64ths, on slide to 32ds and 64ths. D, divided on outside to 8ths, 16ths, 32ds, and 64ths, on slide to 64ths and 100ths. Others are divided for button gauges, on outside to 16ths, 20ths, 32ds and 40ths, and on slide to 40ths and 80ths of inches.

Price.....$3 50

DARLING, BROWN & SHARPE'S MACHINISTS' TOOLS.

Fig. 694.



STANDARD STEEL RULES.

Inches	1	2	3	4	6	9	12	18	24	36	48
Price	.25	.40	.50	.75	1.00	1.50	2.00	3.00	4.00	8.00	12.00

The rules in this list are divided five ways in parts of inches as follows:

No. 1 Graduations.	No. 2 Graduations.	No. 3 Graduations.
1st cor. 10, 20, 50, 100.	10, 20, 50, 100.	16, 32, 64.
2d cor. 12, 24, 48.	12, 24, 48.	16.
3d cor. 16, 32, 64.	16, 32, 64.	16.
4th cor. 14, 28.	8.	8.

No. 4 Graduations.	No. 6 Graduations.
1st cor. 64.	1st cor. 32 whole length.
2d cor. 32.	2d cor. 48 "
3d cor. 16.	3d cor. 50 "
4th cor. 8.	4th cor. 64 "

12 in. steel Rule of No. 5 graduation $3 00
24 " " " " 6 00

No. 5 Graduations.

1st cor. 16, 32, 64.
2d cor. 11, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25.
3d cor. 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 38.
4th cor. 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 100.

GEAR RULES.

No. 61, $3 00 — 12 in. steel rule divided to 18, 20, 22, 24, 26, 28, 30 and 32 parts of an inch, whole length.

No. 78, 3 00 — 12 in. steel rule, divided to 6, 7, 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, parts of an inch. 1 inch of each division.

The rules of No. 5 graduation can also be used for sizing gears.

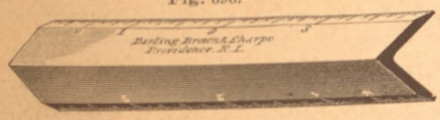
SHRINK RULES.

$5 00 — 24½ in. steel Rule Shrink on one side and standard on the other. Divided on each side to 10, 20, 50, 100, 12, 24, 48, 16, 32, 64, parts of an inch.

$5 00 — 24½ in. steel Rule Shrink on both sides. No. 1 graduation.

$3 00 — 24½ in. boxwood Rule Shrink on both sides, No. 1 graduation.

Fig. 696.

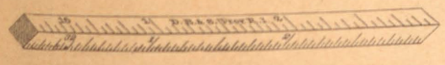


KEY SEAT RULES.

With this rule parallel lines on shafts for key seats, mortises, &c., can be readily and accurately drawn. Its uses are so obvious to machinists as to need no further description.

Price $2 50

Fig. 698.



SQUARE STEEL RULES.

3 in..... 30c.; 4 in..... 75c.; 6 in..... $1 00

Graduations.

8, 16, 32, 64 to the inch whole length.
16, 32, 64, 100 " " "
16, 64, 50, 100 " " "

Fig. 695.

FLEXIBLE RULES.

We also furnish a very thin watch spring tempered scale one-half inch wide, nicely graduated on one side, 32 and 64. It will easily conform to a two inch circle and is highly prized by mechanics for measuring irregular surfaces.

Inches	1	2	3	4	6	9	12	18	24	36
Price	.25	.35	.45	.60	.80	1.25	1.60	2.50	3.50	5.00

BEVELED STEEL STRAIGHT EDGES.

12 in. long,	$1\frac{3}{8}$	in. wide,	$\frac{3}{16}$	in. thick		$2 00
18 "	$1\frac{3}{4}$	"	$\frac{3}{16}$	"		3 00
24 "	2	"	$\frac{3}{16}$	"		4 00
36 "	3	"	$\frac{1}{4}$	"		9 00
48 "	3	"	$\frac{1}{4}$	"		12 00

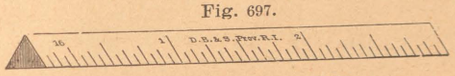
The beveled edges are $\frac{1}{16}$ ince thick. Only one edge is beveled.

STANDARD STEEL STRAIGHT EDGES.

Of same width and thickness as Standard Rules.

6 in. long,	1,	in. wide,	$\frac{1}{10}$	in. thick		$0 75
9 "	$1\frac{1}{8}$	"	$\frac{1}{10}$	"		1 12
12 "	$1\frac{1}{4}$	"	$\frac{1}{10}$	"		1 50
18 "	$1\frac{1}{2}$	"	$\frac{1}{8}$	"		2 25
24 "	2	"	$\frac{1}{8}$	"		3 00
36 "	$2\frac{3}{8}$	"	$\frac{1}{8}$	"		6 00
48 "	3	"	$\frac{1}{8}$	"		9 00

Fig. 697.



TRIANGULAR STEEL RULES.

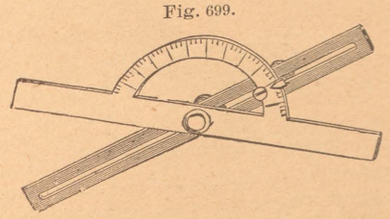
3 in.....60c., 4in.....80c.; 6 in....$1.20; 12 in....$3 00

Graduations.

16, 64, 100 to the inch whole length.
16, 32, 64 " " "
20, 50, 100,—12, 24, 48,—16, 32, 64 to the inch.

The 12 in. are divided only as follows: 8, 10, 12, 14, 16, 20, 24, 28, 48, 50, 64, 100 to the inch.

Fig. 699.



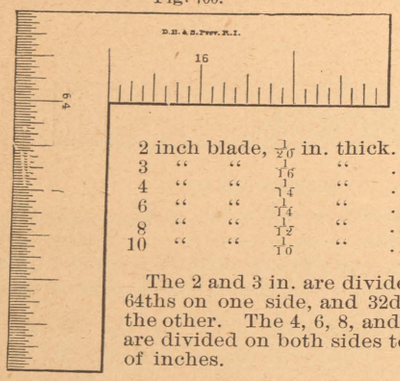
BEVEL PROTRACTOR.

With sliding arm, and half-circle divided to degrees.

Price, with 6 in. sliding arm $6 50
" 10 " " 7 00

DARLING, BROWN & SHARPE'S MACHINISTS' TOOLS.

Fig. 700.

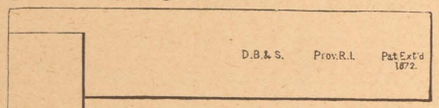


2 inch blade,	$\frac{1}{20}$	in. thick	$ 1 50
3 " "	$\frac{1}{16}$	"	2 00
4 " "	$\frac{1}{14}$	"	2 50
6 " "	$\frac{1}{14}$	"	3 50
8 " "	$\frac{1}{12}$	"	4 50
10 " "	$\frac{1}{10}$	"	5 50

The 2 and 3 in. are divided to 16ths and 64ths on one side, and 32ds and 64ths on the other. The 4, 6, 8, and 10 in. squares are divided on both sides to 16ths and 32ds of inches.

Thin Steel Squares for Machinists and Draughtsmen.

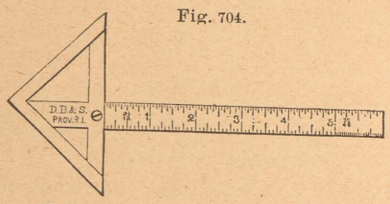
Fig. 702.



1½ inch	$ 2 50
3 "	3 50
4½ "	4 50
6 "	6 00
9 "	9 00
12 "	12 00
15 "	15 00
18 "	18 00
24 "	30 00
30 "	40 00
36 "	50 00

Pat. Hardened Cast Steel Try Squares for Machinists.

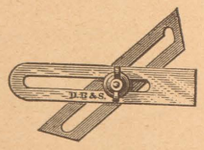
Fig. 704.



Universal or Center Squares.

4 inch	$ 2 50
6 "	3 00
8 "	4 00
10 "	5 50
12 "	7 00

Fig. 706.



Small Universal Bevel.

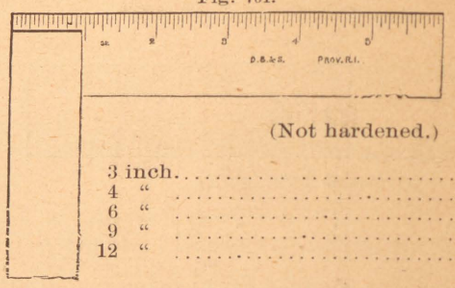
Large size, price ..... $ 2 00

The head and tongue are each three inches long and $\frac{5}{8}$ inch wide. Thickness of head $\frac{1}{8}$ inch, and of tongue $\frac{39}{64}$ inch.

Small size, price ..... $ 1 50

The head and tongue are each one and one-quarter inch long and one-quarter inch wide. Thickness of head three-thirty-seconds inch, and of tongue one-thirty second inch.

Fig. 701.

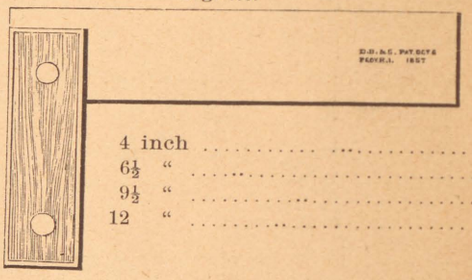


(Not hardened.)

3 inch	$ 2 50
4 "	3 00
6 "	4 00
9 "	7 00
12 "	8 00

Graduated Steel Squares for Machinists.

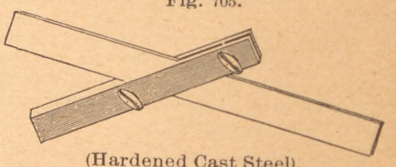
Fig. 703.



4 inch	$ 1 25
6½ "	1 75
9½ "	2 50
12 "	3 50

Patent Hardened Squares for Wood Workmen.

Fig. 705.



(Hardened Cast Steel).

T Square and Universal Bevel.

The head is five inches, and the tongue eight inches long. Both parts are hardened, and ground straight and square. The tongue may be used at the extreme end of the beam. The wide side of the the three cornered washer should always be placed next to the blade.

Price ..... $ 5 00

PLUMB BOBS.

Fig. 707.

Bronze, with screw cap and steel point	$ 2 00
Bronze, without screw cap	1 50
Iron " "	60

Weight about 8 ounces.

Adjustable Plumb Bob, with Reel.

No. 1.	Small	Bronze, steel point	$ 1 50
No. 1.	Large	" " "	1 75
No. 5.	"	Iron " "	1 00

SET SCREWS AND STUD BOLTS.

CASE-HARDENED, SQUARE HEAD SET SCREWS.

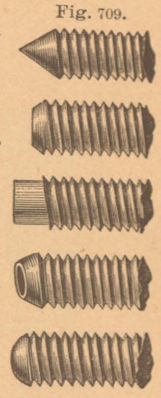
PRICE PER HUNDRED.

Fig. 708.

Diameter	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Length under Head to Point. 3/4	2 00	2 20	2 50	2 90	3 40	4 25	5 00					
1	2 15	2 35	2 65	3 10	3 60	4 25	5 00	7 00				
1 1/4	2 30	2 50	2 80	3 30	3 80	4 50	5 25	7 00	11 30			
1 1/2	2 45	2 65	2 95	3 50	4 00	4 75	5 50	7 50	11 30	14 90		
1 3/4	2 60	2 80	3 10	3 70	4 20	5 00	5 75	8 00	12 00	15 90	19 50	
2	2 80	3 00	3 30	3 95	4 45	5 30	6 05	8 60	12 90	17 00	21 10	25 30
2 1/4		3 25	3 55	4 25	4 75	5 65	6 40	9 30	13 80	18 40	22 90	27 40
2 1/2			3 85	4 60	5 10	6 05	6 80	10 00	14 80	19 80	24 70	29 60
2 3/4				5 00	5 50	6 50	7 25	10 80	15 90	21 40	26 70	32 00
3					5 95	7 00	7 75	11 70	17 10	23 00	28 80	34 60
Threads to inch	20	18	16	14	12	12	11	10	9	8	7	7
Add for each 1-4 in.	25	30	35	45	50	55	60	1 00	1 30	1 70	2 20	2 80

Above List applies to Headless Set Screws and Hanger Screws, without Nuts.

Fig. 709.



State by number the kind of point desired.
Oval, 1. Cup, 2. Flat, 3. Square, 4. Pointed, 5.

Fig. 710.

STEEL SET SCREWS.

PRICE PER HUNDRED.

Diameter of Screw.	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1
Length under Head to Point. 3/4	4 80	5 30	6 00	6 95	8 15	9 60	12 00			
1	5 15	5 65	6 35	7 45	8 65	10 20	12 00	16 80		
1 1/4	5 50	6 00	6 70	7 95	9 15	10 80	12 60	16 80	24 60	
1 1/2	5 85	6 35	7 05	8 45	9 65	11 40	13 20	18 00	24 60	34 60
1 3/4	6 20	6 70	7 45	9 00	10 20	12 10	13 90	19 30	26 20	34 60
2	6 60	7 10	7 90	9 60	10 80	12 80	14 70	20 80	28 00	36 90
2 1/4		7 55	8 40	10 20	11 50	13 60	15 50	22 40	30 00	39 50
2 1/2			9 00	11 00	12 20	14 50	16 40	24 10	32 30	42 50
2 3/4				11 80	13 00	15 50	17 40	25 90	34 70	46 00
3					13 90	16 60	18 50	27 80	37 30	50 00
Threads to Inch,	20	18	16	14	12	12	11	10	9	8
Add for each 1/4 inch,	45	50	70	90	1 00	1 20	1 25	2 00	2 80	4 50

STUDS FOR STEAM ENGINES, PUMPS, &c.

PRICE PER HUNDRED.

Fig. 711.

In ordering, specify length of parts by number.

Diameter.	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8
Length of Stud. 1 1/4	3 35	4 05	4 40	5 10							
1 1/2	3 50	4 20	4 60	5 30	6 10						
1 3/4	3 65	4 35	4 80	5 50	6 30						
2	3 80	4 50	5 00	5 70	6 50	8 80					
2 1/4	3 95	4 65	5 20	5 90	6 70	9 10					
2 1/2	4 10	4 80	5 40	6 10	6 90	9 40	12 00				
2 3/4	4 25	4 95	5 60	6 30	7 10	9 70	12 50				
3	4 40	5 10	5 80	6 50	7 30	10 00	13 00	17 00	21 00		
3 1/4		5 25	6 00	6 70	7 50	10 30	13 50	17 75	22 00		
3 1/2		5 40	6 20	6 90	7 70	10 60	14 00	18 50	23 00	27 00	
3 3/4			6 40	7 10	7 90	10 90	14 50	19 25	24 00	28 00	
4			6 60	7 30	8 10	11 20	15 00	20 00	25 00	29 00	33 00
4 1/2				7 50	8 40	11 65	15 75	21 00	26 50	30 50	34 50
5				7 70	8 70	12 10	16 50	22 00	28 00	32 00	36 00
5 1/2					9 00	12 55	17 25	23 00	29 50	33 50	37 50
6					9 30	13 00	18 00	24 00	31 00	35 00	39 00
No. Threads to Inch,	16	14	12	12	11	10	9	8	7	7	6

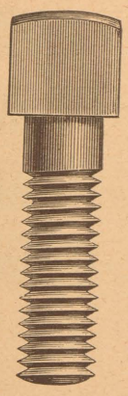
The Tap End of Stud is made to fit more tightly than Nut End.

CAP SCREWS AND BABBITT METAL.

SQUARE HEAD CAP SCREWS.

PRICE PER HUNDRED.

Fig. 712.

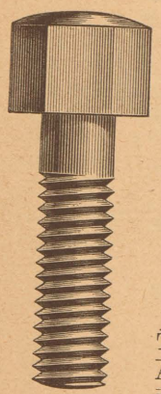


Diam. of Head..	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Length of Head	$\frac{9}{32}$	$\frac{11}{32}$	$\frac{13}{32}$	$\frac{15}{32}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$	$1\frac{5}{16}$
Diameter	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Length under Head to Point. $\frac{3}{4}$	2 40	2 75	3 20	3 80	4 40	5 75						
1	2 60	2 95	3 40	4 00	4 70	5 75	7 70					
$1\frac{1}{4}$	2 75	3 10	3 65	4 20	4 95	6 05	7 70	10 50				
$1\frac{1}{2}$	2 90	3 30	3 85	4 45	5 25	6 35	8 25	10 50	14 00			
$1\frac{3}{4}$	3 05	3 50	4 10	4 70	5 55	6 65	8 80	11 10	14 80	18 00		
2	3 25	3 70	4 35	4 95	5 90	7 05	9 40	11 80	15 70	19 00	22 50	
$2\frac{1}{4}$		4 00	4 65	5 25	6 30	7 55	10 10	12 60	16 70	20 20	24 00	30 00
$2\frac{1}{2}$			5 00	5 60	6 75	8 15	10 90	13 50	17 80	21 50	25 80	32 00
$2\frac{3}{4}$				6 00	7 25	8 85	11 80	14 60	19 10	23 10	27 90	34 20
3					7 80	9 65	12 80	15 90	20 60	25 00	30 50	37 00
Threads to inch	20	18	16	14	12	12	11	10	9	8	7	7
Add for each 1-4 in.	25	35	45	55	65	90	1 20	1 50	1 80	2 30	3 00	3 50

HEXAGONAL HEAD CAP SCREWS.

PRICE PER HUNDRED.

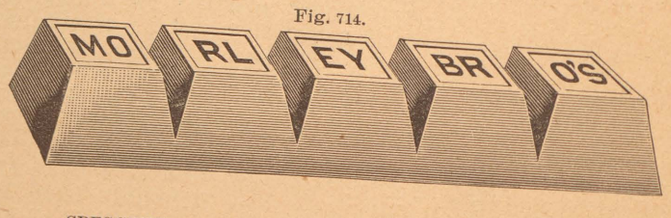
Fig. 713.



Diam. of Head	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$
Length of Head	$\frac{9}{32}$	$\frac{11}{32}$	$\frac{13}{32}$	$\frac{15}{32}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{16}$	$1\frac{3}{16}$
Diameter of Screw,	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$
Length under Head to Point. $\frac{3}{4}$	3 00	3 25	3 75	4 40	5 50	7 00					
1	3 25	3 50	4 00	4 70	5 70	7 00	9 50				
$1\frac{1}{4}$	3 50	3 75	4 25	5 00	6 00	7 50	9 50	12 20			
$1\frac{1}{2}$	3 75	4 00	4 50	5 30	6 30	8 00	10 00	12 20	16 00		
$1\frac{3}{4}$	4 00	4 25	4 75	5 60	6 60	8 50	10 60	12 80	16 60	21 20	
2	4 25	4 60	5 05	5 95	7 00	9 10	11 20	13 40	17 20	22 30	29 00
$2\frac{1}{4}$		5 00	5 40	6 35	7 50	9 70	11 90	14 10	17 90	23 60	30 50
$2\frac{1}{2}$			5 80	6 80	8 00	10 40	12 70	14 90	18 80	25 10	32 30
$2\frac{3}{4}$				7 30	8 60	11 20	13 60	15 90	20 00	26 90	34 40
3					9 30	12 10	14 70	17 00	21 80	29 00	37 00
Threads to Inch,	20	18	16	14	12	12	11	10	9	8	7
Add for each $\frac{1}{4}$ inch,	30	40	50	60	80	1 00	1 30	1 60	2 00	2 40	3 00

BABBITT METAL.

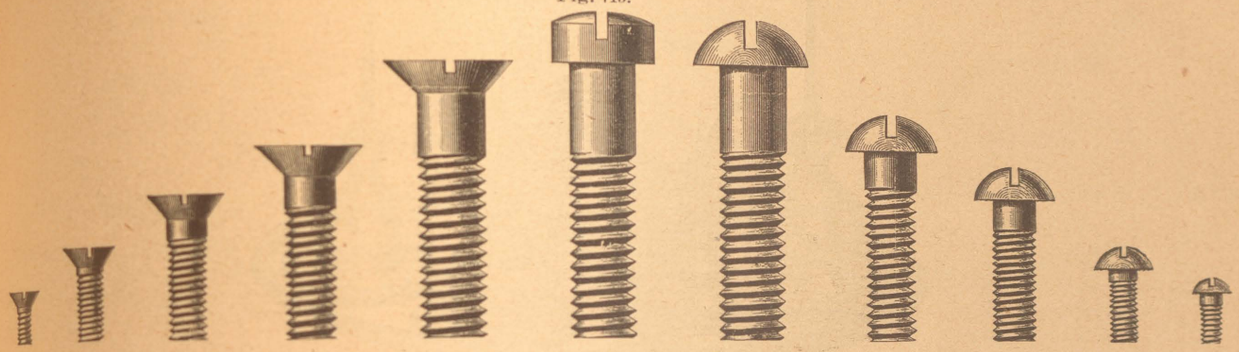
Fig. 714.



GENUINE.	CRESCENT.	EXTRA.	NO. 1.	NO. 4.
Per lb.....	.....	.....	.....	.....

MACHINE SCREWS.

Fig. 715.



REVISED LIST, APRIL 27, 1881.

IRON MACHINE SCREWS.—Per Gross.

	Threads per inch.									
	32, 36	30 & 32		24,30,32	20 & 24		16,18,20	16 & 18		16
Nos.	4	6	8	10	12	14	16	18	20	24
Inch.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
¼	55	55	65							
5-16.	55	55	65							
⅜	55	55	65	75	85	95	105			
½	55	55	65	75	85	95	105	115	120	
⅝	.....	60	65	75	85	95	105	115	120	
¾	.....	.....	65	75	85	95	105	120	125	150
⅞	.....	.....	.....	85	95	105	110	125	130	160
1	.....	.....	.....	95	95	110	115	130	135	170
1¼	.....	.....	.....	.....	100	120	125	135	145	190
1½	.....	.....	.....	.....	.....	130	135	145	160	200

BRASS MACHINE SCREWS.—Per Gross.

	Threads per Inch.									
	32,36	30 & 32		24,30,32	20 & 24		16,18,20	16 & 18		16
Nos.	4	6	8	10	12	14	16	18	20	24
Inch.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
¼	70	80	110							
5-16	70	80	110							
⅜	70	80	110	145	170	200	230			
½	70	80	115	145	170	200	230	330	370	
⅝	.....	90	120	155	180	220	250	330	370	
¾	.....	.....	125	165	195	240	270	360	400	630
⅞	.....	.....	.....	175	210	255	295	390	440	630
1	.....	.....	.....	190	230	275	320	415	470	680
1¼	.....	.....	.....	.....	270	325	375	480	550	780
1½	.....	.....	.....	.....	.....	370	430	545	630	805

FINISHED HEXAGON NUTS.

For Bolt.	*Thickness.*	*Diameter.*	*No. of Threads.*	*Each.*	*For Bolt.*	*Thickness.*	*Diameter.*	*No. of Threads.*	*Each.*
⅜	⅜	1 1/16	16	9	¾	¾	1¼	10	18
7/16	7/16	2 5/32	14	10	⅞	⅞	1 7/16	9	22
½	½	⅞	13	10	1	1	1⅝	8	30
9/16	9/16	3 1/32	12	12	1⅛	1⅛	1 13/16	7	35
⅝	⅝	1 1/16	11	15	1¼	1¼	2	7	45

SHEET BRASS.

EITHER HARD, SOFT OR SPRING.

HIGH BRASS, IN ROLLS.

	Per Lb.
All Nos. to No. 28, and widths 2 to 12 inches,	30c.
" " " 28, " " 14 to 20 "	35c.
" " " 28, " " 20 to 30 "	38c.

" " above No. 28 to 38 advance ½c. each No.

" " " No. 38 is Platers' Brass, 53c. per lb.

HIGH BRASS, IN SHEETS.

	Per Lb.
All sheets 2 to 30 inches wide, cut to lengths,	37c.
" " 30 to 40 " " " " "	47c.
" " 40 inches and wider, " "	50c.

Low Brass, in rolls or sheets, four cents per pound more than High Brass.

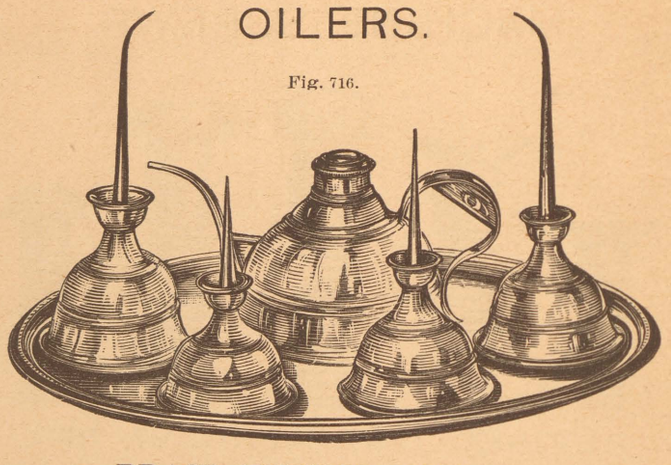
The terms High and Low Brass refer simply to color, and not to temper; High Brass being yellow color, and Low Brass being of a reddish or copper color.

STUBS' WIRE GAUGE, IN INCHES.

	5/16 inch.
No. 1, Stubs' Wire Gauge,	¼ "
No. 4, " " "	3/16 "
No. 7, " " "	⅛ "
No. 11, " " "	1/16 "
No. 16, " " "	1/32 "
No. 22, " " "	

OILERS.

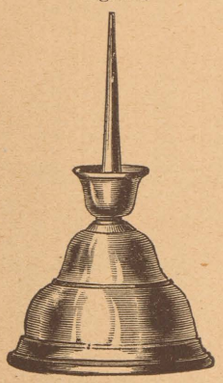
Fig. 716.



BRASS, ENGINEERS' SET.

Four pieces and tray, small $4 75
Five " " large 6 00

Fig. 717.



PARAGON OILER.

ZINC OILERS.—Fig. 718.

No. 0. Tin bottom, per dozen $1 00
1. " " " 1 25
2. " " " 1 50
3. " " " 1 75
4. " " " 2 25
5. " " " 3 00
6. " " " 4 00

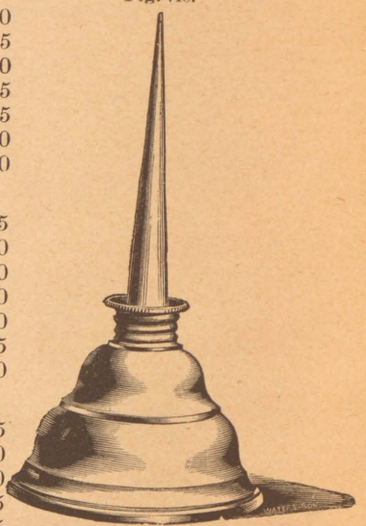
COPPER AND BRASS OILERS.—Fig. 718.

No. 0. Per dozen $2 25
1. " 2 50
2. " 3 00
3. " 3 50
4. " 4 50
5. " 5 75
6. " 7 00

PARAGON OILERS.

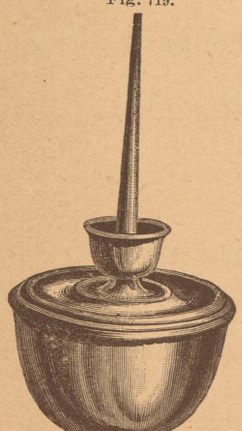
No. 0. Zinc, with drip cup, tin bottom, per doz ... $1 75
1. " " " " ... 2 00
2. " " " " ... 2 50
3. " " " " ... 2 75
4. " " " " ... 3 25
5. " " " " ... 4 00
6. " " " " ... 5 00

Fig. 718.



COMMON OILER.

Fig. 719.



AUTOMATIC OILER.

AUTOMATIC OILERS.

No. 1. Zinc, per doz $3 00
2. " " 3 60
3. " " 4 00
1. Brass " 5 00
2. " " 6 00
3. " " 7 00

OLMSTED'S IMPROVED OILERS.

No. 00. Tin, per doz $5 00
0. Long bent spout 4 25
0. For Engineers, &c 4 00
1. Machinists' size 3 60
2. " " 3 00
3. Sewing machine size 2 40

Malleable iron oilers, per doz $6 00

Fig. 720.

MALLEABLE OILER.

MORLEY BROTHERS

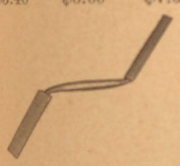
CHAS. MONK'S CELEBRATED MOULDERS' TOOLS.

SPOON.

Width, in.	1	1¼	1½
Doz.,	$6.00	$7.50	$9.00

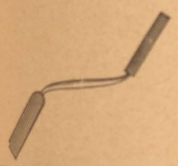
TAPER ROUND.

Width, in.	¾	1	1¼	1½
Doz.,	$5.40	$6.00	$7.50	$9.00



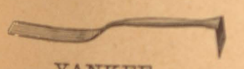
SQUARE STRAIGHT.

Width, in.	½	⅝	¾	⅞	1
Doz.,	$5.25	$6.00	$6.75	$7.50	$8.25



DOUBLE SQUARE.

Width, in.	½	⅝	¾	⅞	1
Doz.,	$4.80	$5.40	$6.00	$6.75	$7.50



YANKEE.

Width, in.	½	⅝	¾	⅞	1
Doz.,	$5.25	$6.00	$6.75	$7.50	$8.40

HALF ROUND CORNER.

Width, in.	1	1¼	1½	1¾	2
Doz.,	$5.25	$6.00	$6.75	$7.50	$8.25

SQUARE CORNER.

Width, in.	2	2½	3
Doz.,	$6.00	$7.20	$8.40

PIPE.

$5.40 per dozen.

SQUARE TROWELS.

Length, in.	4	4½	5	5½	6
1 in.,	$6.00	$6.60	$7.20	$7.80	$8.40
1¼ "	7.20	7.80	8.40	9.00	9.60
1½ "	8.40	9.00	9.60	10.20	10.80
1¾ "	9.60	10.20	10.80	11.40	12.00
2 "	10.80	11.40	12.00	12.60	13.20

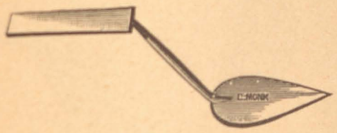
PER DOZEN.

HEART TROWELS.

Width, in.	2	2¼	2½	2¾	3
Doz.,	$6.00	$7.50	$9.00	$10.50	$12.00

OVAL DOG TAIL.

In.	¾	1	1¼
Doz.,	$6.00	$6.75	$8.25

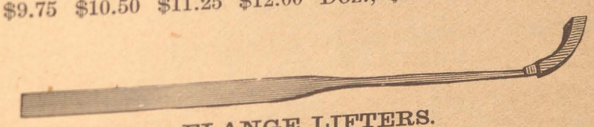


HEART AND SQUARE.

Width, in.	1	1¼	1½	1¾	2
Doz.,	$6.00	$7.50	$9.00	$10.50	$12.00

FLANGE AND BEAD.

W'th, in.	½	⅝	¾	⅞	1
Doz.,	$9.00	$9.75	$10.50	$11.25	$12.00



FLANGE LIFTERS.

½x1¼	½x16	⅝x14	⅝x16	¾x14	¾x16	¾x18	⅞x16	⅞x18	⅞x20	1x16
$12.75	$13.50	$13.50	$14.25	$14.25	$15.00	$15.75	$15.75	$16.50	$17.25	$16.50

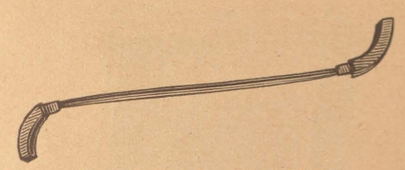
PER DOZEN.

FLUTE.

Width, in.	⅜	⅝	⅞
Doz.,	$7.50	$8.25	$9.00

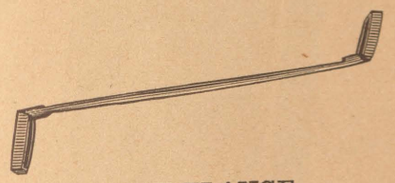
BEAD.

Width, in.	½	⅝	¾
Doz.,	$6.00	$6.75	$7.50



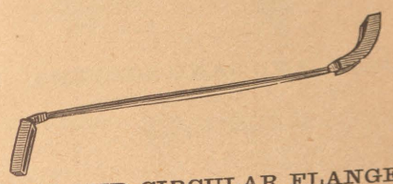
CIRCULAR FLANGE.

W'th, in.	½	⅝	¾	⅞	1
Doz.,	$10.50	$12.00	$13.50	$15.00	$16.50



FLAT FLANGE.

W'th, in.	½	⅝	¾	⅞	1
Doz.,	$9.75	$10.50	$12.00	$13.50	$15.00



FLAT AND CIRCULAR FLANGE.

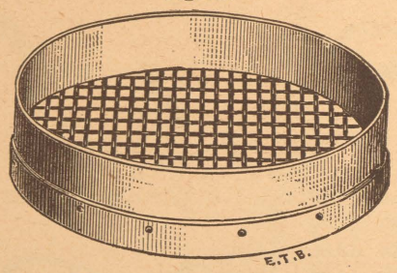
W'th. in.	½	⅝	¾	⅞	1
Doz.,	$12.00	$13.50	$15.00	$16.50	$18.00

LIFTERS.

Length,	⅛	¼	⅜	½	⅝	¾	⅞	1
10 inches	$4.50	$4.75	$5.25	$6.00				
12 "	5.25	5.50	6.00	6.75	$7.50	$ 8.25	$ 9.00	$ 9 75
14 "	6.00	6.50	6.75	7.50	8.25	9.00	9.75	10.50
16 "				8.25	9 00	9.75	10.50	10.75
18 "						10.50	11.25	12.00
20 "						11.25	12.00	12.75

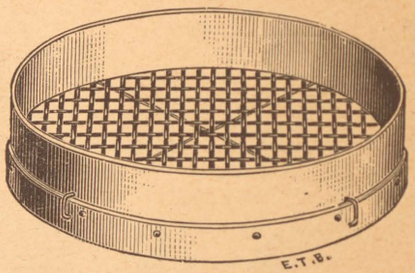
MOULDERS' SUPPLIES.

Fig. 740.



STEEL WIRE RIDDLE.

Fig. 741.

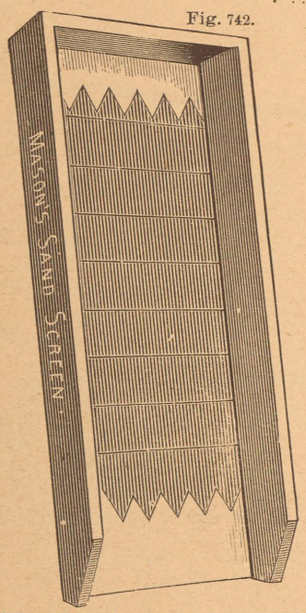


BRASS WIRE RIDDLE.

SAND RIDDLES.

Brass, all numbers, per dozen	$ 12 00
Steel, " "	6 00
Galvanized " "	8 00

Fig. 742.



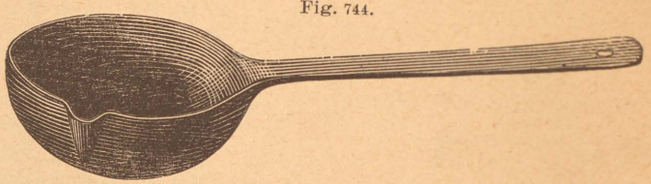
COAL AND SAND SCREENS.
Made of extra heavy wire.

Fig. 743.

MOULDERS' SHOVEL.

Price per dozen $14 50

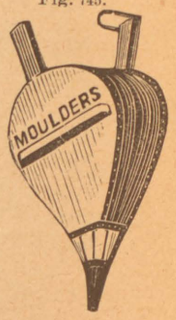
Fig. 744.



HAND LADLES.

MOULDERS' BELLOWS.

Fig. 745.



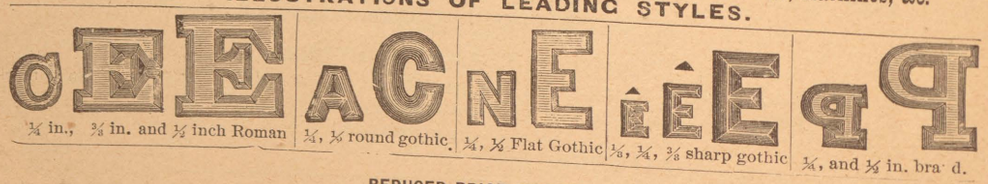
Moulders' Bellows, inches	9	10	11	12	13	14	15	16	17
Price, per dozen	17 00	20 00	23 00	27 00	30 00	33 00	35 00	40 00	45 00

Fig. 746.

METALLIC LETTERS AND FIGURES,

For Foundrymen, Machinists and Pattern Makers, to put on Patterns of Stoves, Machines, &c.

ILLUSTRATIONS OF LEADING STYLES.



¼ in., ⅜ in. and ½ inch Roman | ¼, ½ round gothic. | ¼, ½ Flat Gothic | ¼, ¼, ⅜ sharp gothic | ¼, and ½ in. bra d.

REDUCED PRICE LIST OF ROMAN AND GOTHIC SIZES.

Size	⅛	3/16	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1	1¼	1½	2
Price, cents	2	2	2	2	2½	2½	2½	3	3	3½	4	4½	6	7½	9

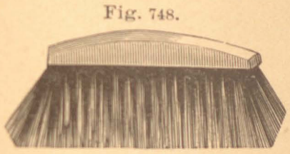
MOULDERS' SUPPLIES.

Fig. 747.

MACHINE MOULDERS' SOFT BRUSH.

No. 1, Best Bristle, $7.20 per dozen.

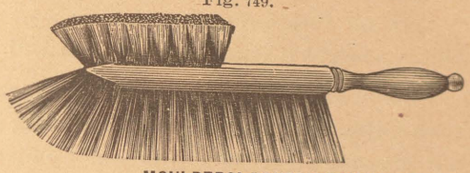
Fig. 748.



STOVE MOULDERS' BRUSH.

Best Bristle, $6.00 per dozen.

Fig. 749.



MOULDERS' DOUBLE BRUSH.

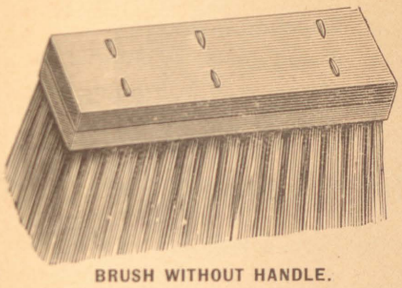
No. 1, Best Bristle, $7.20 per dozen.

STEEL CASTING BRUSHES.

Fig. 750.

BRUSH WITH HANDLE.

Fig. 751.



BRUSH WITHOUT HANDLE.

Fig. 752.

ROUND CASTING BRUSH.

Common Size, 3½ inch Wire,.....4 Row, $3 75; 5 Row, $4 75; 6 Row, $5 65 per dozen
With Handle, " " " ....." " " 4 25; " " 5 25; " " 6 15 " "
Round Casting Brushes, 5 inch Wire,..... 4 50 " "

CRUCIBLES.

SIZES OF DIXON'S CRUCIBLES.

Nos.	Height Outside.	Diam. at the Top Outside.	Diam. at the Bilge Outside.	Diam. at the Bottom Outside.	Weight of the Crucible.		Capacity of Crucible by Weight of Water.	
	Inches.	Inches.	Inches.	Inches.	Lbs.	Oz.	Lbs.	Oz.
1	3¼	2⅝	2⅝	1⅝		9		4¼
2	3⅝	2¾	3	2⅛		12		6½
3	4½	3½	3⅝	2¾	1	8		11
4	5	4	4 3/16	3	1	13	1	
5	5¼	4¼	4⅝	3⅛	2	4	1	4
6	5⅝	4½	4⅝	3⅜	2	12	1	12
7	6¼	4⅞	5	3½	3	3	2	
8	6½	5	5 1/16	3⅝	3	8	2	4
10	7⅜	5 1/16	5⅝	4¼	4	12	3	
12	8	6	6¼	4½	6	8	4	8
14	8⅝	6¾	7 3/16	5⅛	8	8	5	4
16	9	7	7½	5⅝	9	4	6	4
18	9½	7¼	7⅝	5⅞	10	4	7	4
20	9¾	7⅝	8¼	6	12	8	8	12
25	10¼	8	8⅝	6½	14	4	10	4
30	11	8⅝	9	6⅞	15	12	12	4
35	11⅞	9⅛	9⅞	7¼	19	12	15	8
40	12¼	9 3/16	10¼	7⅜	22		18	
45	13	9⅝	10½	7½	25		20	
50	13⅜	9¾	10⅞	7⅞	27	8	22	
60	13¾	10⅛	11⅛	8	28	8	24	
70	14½	10⅜	11 3/16	8⅛	33		26	4
80	15	10⅝	12	8⅜	37	8	29	
100	16	11⅛	12⅝	9	42		32	4
125	16½	12⅛	13⅜	9⅞	51	12	43	8
150	18	12⅞	14⅛	10⅛	59		51	8
200	19¾	14¼	15⅜	10⅝	73	8	69	8
300	21	15½	17	11½	103	8	80	8

PRICE LIST.

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 10 and 12.

Per dozen .....

Fig. 753.

ALL SIZES.

PRICE LIST.

Nos. 14 and upwards,

Per No.....

FOUNDRY FACINGS AND BLACKING.

Black Lead, first quality,.....5¾ cts. per lb.
Plumbago Facing and Blacking,.....3½ " "
Pure Mineral, ...3¾ " "
Heavy Machine Facing and Blacking, ...3¾ " "
Blackstone R. I. Facing,..... .....3¾ " "
Eagle Return Facing,.....3 " "
Selected Charcoal Facing,..... .....3 " "
Commercial Coke Facing, ...2 " "
Charcoal Facing, ...2¼ " "
Lehigh Facing, ...2¼ " "
Anthracite Facing, ...2 " "
Md. Soapstone Facing, ...2 " "

Sea Coal Facing, in 200 lb. barrels, $1.50 per barrel.

TO TEST STEEL AND IRON.

NITRIC ACID will produce a black spot on steel; the darker the spot the harder the steel. Iron, on the contrary, remains bright if touched with nitric acid.

GOOD STEEL in its soft state has a curved fracture and a uniform gray lustre; in its hard state a dull, silvery, uniform white. Cracks, threads, or sparkling particles denote bad quality. Good steel will not bear a white heat without falling to pieces, and will *crumble* under the hammer at a *bright* red heat, while at a medium heat it may be drawn to a fine point.

TEMPERING STEEL.

COLOR.	PURPOSE.	TEMPERATURE.
Light straw	Turning Tools, for metal	430° Fahrenheit.
Dark straw	Wood Tools, Taps and Dies	470° "
Brown yellow	Hatchets and Chipping Chisels	500° "
Dark purple	Springs, &c	550° "

NOTES ON WORKING STEEL.

By WM. METCALF, C. E.

1. A good soft heat is safe to use if steel be immediately and thoroughly worked. It is a fact that good steel will endure more pounding than iron.
2. If steel be left long in the fire it will lose its steely nature and grain, and partakes of nature of cast iron. Steel should never be kept hot any longer than is necessary for work to be done.
3. Steel is entirely mercurial under action of heat, and careful study of the tables will show that there must of necessity be an injurious internal strain created whenever two or more parts of same pieces are subjected to different temperatures.
4. It follows that when steel has been subjected to heat not absolutely uniform over the whole mass, careful annealing should be resorted to.
5. As a change of volume due to a degree of heat increases directly and rapidly with the quantity of carbon present, therefore high steel is more liable to dangerous internal strains than low steel, and great care should be exercised in the use of high steel.
6. Hot steel should always be put in a perfectly dry place of even temperature while cooling.
7. Burned steel *can not* be restored except through the knobbing fire or blast furnace.
8. Be careful not to overdo the annealing process; if carried too far it does great harm; and it is one of the commonest modes of destroying good steel. It is hard to induce the average worker in steel to believe that very little annealing is necessary, and that very little is much better than a great deal.

Strength of steel is reduced by being hardened in water; but both the hardness and toughness are increased by being hardened in oil.

MIXTURE FOR WELDING STEEL.

1 part Sal Ammoniac. 10 parts Borax.

Pounded together and fused until clear, when it is poured out, and, after cooling, reduce to powder.

TO FIND APPROXIMATE WEIGHT OF IRON CASTING FROM WOOD PATTERN

The latter is multiplied by the following figures: If of pine, 14.0; oak, 9.0; beech, 9.7; birch, 10.6.

USEFUL INFORMATION.

STONE WALL.

The contents of stone walls is estimated in cords; 96 cubic feet of wall making one cord.
One hundred and twenty-eight cubic feet of loose stone will lay about 96 cubic feet in wall.

BRICK WORK.

An 8 inch wall contains about 15 bricks to a square foot.
A 12 inch wall contains about 22½ bricks to a square foot.
A 16 inch wall contains about 30 bricks to a square foot.
A 20 inch wall contains about 37½ bricks to a square foot.

CEMENT.

Four barrels of good cement mixed with 24 bushels of sand will make into mortar sufficient for one cord of stone. Concrete is made of one barrel of cement to four of gravel.

LIME.

Three bushels of quick lime mixed with 12 bushels of sand will make into mortar sufficient for 1000 bricks.

PLASTERING.

Seven bushels of quick lime mixed with 30 bushels of sand and one bushel of hair will cover 100 square yards of brown coat.

For putty coat mix three and one-half bushels quick lime with one-half barrel calcine plaster and a little fine sand to cover 100 square yards one coat.

One and three-quarter thousand lath will cover 100 square yards and will take 13 pounds of 3d nails.

SHINGLES.

One thousand 18 inch shingles laid 5½ in to the weather will cover 132 square feet. Five pounds 4d nails will lay one thousand shingles.

PAINTING.

Pure Linseed Oil weighs seven and one-half pounds to the gallon. One hundred pounds of strictly pure white lead will take about five gallons of oil.

One gallon of mixed paint will cover about 260 square feet of surface, two coats.

MENSURATION.

Area of a triangle equals base multiplied by one-half altitude.
Area of parallelogram equals base multiplied by altitude.
Area of circle equals square of diameter multiplied by .7854.
Circumference of circle equals diameter multiplied by 3.1416.
Diameter of circle equals circumference multiplied by .3183.
Surface of sphere or ball equals square of diameter multiplied by 3.1416.
Solid contents of sphere equals cube of diameter multiplied by .5236.
Surface of sides of cylinder equals circumference of end multiplied by length.
Cubical capacity of cylinder equals area of end multiplied by length of cylinder.
For capacity of cylinder or cistern in gallons, divide cubical capacity, in inches, by 231.
A gallon of water contains 231 cubic inches and weighs 8.339 pounds.

SPECIAL NOTICE.

We carry in stock a complete line of CARPENTERS' TOOLS of every description; also, MILLWRIGHTS' TOOLS, COOPERS' TOOLS, WOOD TURNING TOOLS, WOOD CARVING TOOLS, and a complete line of BUILDERS' and GENERAL HARDWARE.

Very Truly Yours,

MORLEY BROTHERS.